HRS DOCUMENTATION RECORD--REVIEW COVER SHEET

Name of Site: Tri-County Public Airport

Contact Persons

Site Investigation: Janice Kroone, U.S. Environmental Protection Agency, On-Scene Coordinator

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Pathways, Components, or Threats Not Evaluated

The surface water and air migration pathways and soil exposure pathway were not included in the scoring of the Tri-County Public Airport (TCPA) Site. These pathways were evaluated but not scored because the ground water migration pathway produced a hazard ranking system (HRS) score well above the minimum needed to qualify for the National Priorities List.

An observed release by chemical analysis to surface water was documented during the Expanded Site Inspection (ESI). The releases were to springs and seeps in Clarks Creek and its tributaries and correspond to the ground water contamination plume. An observed release through the overland/flood migration component of the surface water migration pathway has not been documented. The extent of surface water contamination is limited to the immediate vicinity of springs or seeps, which were sampled as part of the ESI. No sediment contamination has been documented. Although an observed release to surface water has been documented, very few targets associated with impacted surface water have been documented. Previous evaluations have generated a draft surface water migration pathway score of about 0.89, which would contribute little to the overall site score. Based on the limited number of surface water targets and limited effect on the overall site score, this pathway was not scored.

The air migration pathway was not scored, based on a very sparse local population, no past sampling to document an observed release, and a minimal area of low-concentration surface soil. The soil exposure pathway was not scored because of a limited area of documented surficial soil contamination. In addition, the only resident population consists of a small number of workers who are potentially exposed to Level II contamination. No terrestrial sensitive environments have been documented at the site. The nearby population consists of about nine individuals within 1 mile of the site.

OVERVIEW OF POTENTIAL SOURCES NOT EVALUATED

Specific sources of contamination included in the HRS score represent three areas of identified chlorinated solvent releases associated with past, postwar industrial activities at the site. Potential source areas associated with site operations when the site was used as an Army airfield during the 1940s were evaluated as part of a 1994 to 1997 investigation by the U.S. Army Corps of Engineers (USACE). USACE conducted a site inspection and ESI at the Former Herington Army Air Field (HAAF) under the Defense Environmental Restoration Program for Formerly Used Defense Sites. The primary focus of the investigations was fuel-related contamination, because the Department of Defense (DOD) claimed that no chlorinated solvents were used during operation of the HAAF. The investigations focused on 14 areas of interest (AOI) that consisted of operational areas where contamination may have occurred during operation of the site by the DOD. Three AOIs consist of the existing water supply wells, piezometers, and monitoring wells, which are not described below. The remaining eleven AOIs identified by USACE include the following:

- **Landfill**. The landfill is located in the southwestern portion of the site. Trenches in this area reportedly received solid waste. The limits and the exact nature of the waste in the landfill are unknown. In November 1994, one monitoring well and three piezometers were installed around the landfill and sampled. Ground water samples were analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), total petroleum hydrocarbons (TPH), and metals. VOCs detected in piezometers include low, estimated concentrations of acetone (2J micrograms per liter [µg/L]) and xylenes (3J µg/L). The SVOC bis(2-ethylhexyl)phthalate was detected at 2J µg/L. Barium (0.3 milligram per liter [mg/L]), chromium (0.02 mg/L), and lead (0.004 mg/L) were also reported in ground water samples.

- **Wastewater Treatment Plant**. This area is located in the northwestern portion of the site and consisted of Imhoff tanks, followed by an aerobic lagoon. Sludge generated by the plant was dewatered in drying beds. In November 1994, one temporary piezometer and three shallow soil borings were installed around the site and sampled. Ground water samples were analyzed for VOCs, SVOCs, and certain metals. Acetone and di-n-butylphthalate were detected in soil samples and may be attributable to laboratory contamination. Ground water samples showed trichloroethylene (TCE) and dichloroethylene (DCE) contamination at levels above their maximum contaminant levels (MCL). This contamination is likely associated with a separate source area.

- **Fuel Storage Area**. This area was located in the northwestern part of the site and consisted of one 200,000-gallon aboveground storage tank (AST), a truck fill stand, and associated pumps, valves, and pits. The tank was surrounded by an earthen dike. Shortly after the AST was placed in service, gasoline and water were noted in a nearby sump. A leak was discovered in the tank and subsequently repaired. The Army estimated that 14,000 gallons of high-octane fuel were lost from the tank. Some time after the Army occupied the airfield, the tank and associated piping were removed. This potential source area will not be included in the HRS package because of the petroleum exclusion provision of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

- **Motor Repair Area**. The former motor repair area is located in the west-central portion of the site. The exact use of the area is unknown; however, as the name implies, the area was likely used for maintenance and repair of vehicles during operation of the airfield. Two soil samples and one ground water sample were collected from this potential source area. No organic compounds were detected in soil samples collected, and metals concentrations were consistent with background levels. TCE was detected in ground water at levels above the MCL and is likely to be associated with a separate source area.

- **Drainage Ditch.** The drainage ditch is located west of the motor repair area, and the utility yard and receives runoff from both areas. Runoff in the ditch flows to an unnamed, intermittent tributary of Clarks Creek. Two soil samples

and one ground water sample were collected from this potential source area. No organic compounds were detected in soil samples collected, and metal concentrations were consistent with background levels. TCE was detected in ground water at levels above the MCL and is likely to be associated with a separate source area.

- **Airplane Wash Rack**. The airplane wash rack was located in the north-central area of the site. Limited information is available regarding this area. Six soil samples and one ground water sample were collected from this potential source area. TPH as No. 2 fuel oil was detected in soil samples collected. TCE was detected in ground water at levels above the MCL and is likely to be associated with a separate source area.

- **Coal Storage Area**. This area was located in the northwestern area of the site. Coal was stockpiled here until used to provide heat to airfield facilities through the use of coal-fired boilers. Three soil samples were collected from this potential source area. Di-n-butylphthalate, attributed to laboratory contamination, was detected in soil samples, as well as metals at concentrations comparable to background.

- **Base Engine Shop**. The base engine shop was located west of Hangar 1 and was reportedly used for repair of aircraft engines. Four soil samples and one ground water sample were collected from this potential source area. Di-n-butylphthalate, attributed to laboratory contamination, was detected in soil samples, as well as metals at concentrations comparable to background. TCE and DCE were detected in ground water at levels above MCLs and are likely to be associated with a separate source area.

- **Paint Shop**. The paint shop was located south of the base engine repair shop in the west-central portion of the site. Limited information is available regarding this area. Two soil samples were collected from this potential source area. Di-n-butylphthalate, attributed to laboratory contamination, was detected in soil samples, as well as metals at concentrations comparable to background.

- **Paint, Oil, and Dope Facilities**. These facilities were located in the south-central portion of the airfield. This area was reportedly used to store chemical supplies; however, detailed information regarding the types or quantities of materials stored in this area is not available.

- **Delavan Storage Facilities**. This storage area was located on 370 acres, about 2 miles south of the airfield in the Town of Delavan. The facility was served by a railroad and used for the storage of gasoline, oil, and coal. Ten 15,000-gallon and one 5,000-gallon ASTs stored gasoline in this area. The storage method for oil and coal is not known. This potential source area will not be included in the HRS package because of the petroleum exclusion provision of CERCLA and the distance of the potential source area from the airfield.

There are three source areas identified at the site for which adequate documentation exists to attribute the VOCs found in ground water. These sources are:

- Source 1 - Contaminated Soil at Hangar 4
- Source 2 - Contaminated Soil at Hangar 1
- Source 3 - Contaminated Soil at the Potential Burial Area.

The three identified sources will be discussed in detail in the sections that follow. The observed release to ground water will also be discussed in later sections of this documentation record. The CERCLA hazardous substances associated with the three source areas are identified for each source beginning on page 6 of the documentation record.

HRS DOCUMENTATION RECORD

Name of Site: Tri-County Public Airport

EPA Region: 7 Date Prepared: July, 2000

Street Address of Site: Herington Industrial Park

County and State: Morris, Kansas

General Location in the State: The site is located in east-central Kansas, as shown in Figure 2-1 of the Expanded Site Inspection/Remedial Investigation report (Ref. 4).

Topographic Map: The location of the Tri-County Public Airport Site is shown on the Delavan, Kansas, Quadrangle, U.S. Geological Survey, 7.5 Minute Series Topographic Map (Ref. 3).

Latitude: 38°41′46.4″ North Longitude: 96°48′41.7″ West

Scores

Air Pathway	0.00
Ground Water Pathway	100.00
Soil Exposure Pathway	0.00
Surface Water Pathway	0.00
HRS SITE SCORE	50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE

	S	S^2
1. Ground Water Migration Pathway Score (S_{gw}) (From Table 3-1, line 13)	100.00	10,000
2a. Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	NS	---
2b. Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS	---
2c. Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	NS	---
3. Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	NS	---
4. Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	---
5. Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		10,000
6. **HRS Site Score** Divide the value on line 5 by 4 and take the square root.	**50.00**	

NS = Not scored

HRS TABLE 3-1 -- GROUND WATER MIGRATION PATHWAY SCORESHEET
TRI-COUNTY PUBLIC AIRPORT SITE

Factor Categories and Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer:		
1. Observed Release	550	550
2. Potential to Release:		
2a. Containment	10	---
2b. Net Precipitation	10	---
2c. Depth to Aquifer	5	---
2d. Travel Time	35	---
2e. Potential to Release [lines 2a(2b+2c+2d)]	500	---
3. Likelihood of Release (higher of lines 1 and 2e)	550	550
Waste Characteristics:		
4. Toxicity/Mobility	(a)	10,000
5. Hazardous Waste Quantity	(a)	100
6. Waste Characteristics	100	32
Targets:		
7. Nearest Well	50	50
8. Population:		
8a. Level I Concentrations	(b)	432.3
8b. Level II Concentrations	(b)	67
8c. Potential Contamination	(b)	NS
8d. Population (lines 8a+8b+8c)	(b)	499.3
9. Resources	5	5
10. Wellhead Protection Area	20	0
11. Targets (lines 7+8d+9+10)	(b)	554.3
Ground water Migration Score for an Aquifer:		
12. Aquifer Score [(lines 3×6×11)/82,500][c]	100	100
Ground water Migration Pathway Score:		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100	100

a Maximum value applies to waste characteristics category
b Maximum value not applicable
c Do not round to nearest integer
NS Not scored

REFERENCES

Reference Number	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System. 40 CFR Part 300, Appendix A. December 14, 1990. (Excerpt 1 page).
2.	EPA. Superfund Chemical Data Matrix (SCDM). June 1994. (Excerpt 2 pages).
3.	U.S. Geological Survey. Delavan, Kansas. 7.5 Minute Series. Topographic Map. 1972. Features added by Tetra Tech EM Inc. (Tetra Tech).
4.	Ecology and Environment, Inc. (E&E) Final Report Expanded Site Inspection/Remedial Investigation for the Tri-County Public Airport Site, Herington, Kansas. Volume 1 of 2. Technical Directive Document (TDD) No. S07-9705-009. June 7. 1999. Appendices Hand-numbered by Tetra Tech.
5.	E&E. Final Report Expanded Site Inspection/Remedial Investigation for the Tri-County Public Airport Site, Herington, Kansas. Volume 2 of 2. TDD No. S07-9705-009. June 7. 1999. Appendices Hand-numbered by Tetra Tech.
6a.	Raytheon Aircraft Company. Information Request Response to CERCLA Section 104(e), Tri-County Airport Site, Former Herington Army Airfield, Herington, Kansas. November 10, 1997. 62 Pages.
6b.	Miller, Eddie, Former Beech Aircraft Employee, to J. Gadt, E&E. Telephone Conversation Record. October 3, 1997. Two Pages.
6c.	E&E. Spring and Seep Sampling Logbook for Tri-County Public Airport Site, Herington, Kansas. TDD No. S07-9705-009. February 23 through 27, 1998. Eight Pages.
7.	Raytheon Aircraft Company. Record of Meeting with U.S. Environmental Protection Agency, Region 7, Regarding Tri-County Public Airport. October 14, 1999. Five Pages.
8.	Valentine, Maurice, Former Beech Aircraft Employee, to C. Vines, Dynamac. Personal Interview Record. February 18, 1999. Four Pages.
9.	Edmundson, Fred, former Beech Aircraft Employee, to C. Vines, Dynamac. Personal Interview Record. December 7, 1998. Four Pages.
10.	Burns & McDonnell. Final Site Investigation and Expanded Site Investigation Report of the Former Herington Army Airfield at the Tri-County Public Airport. Project No. 94-800-4-004-02. July 1998.
11a.	Mudge, Melville R. U.S. Geological Survey. Geology and Construction-Material Resources of Morris County, Kansas. Geological Survey Bulletin 1060-A. (Only portions of the bulletin referring to the geomorphology of the Chase Group are included in this reference). 1958. Ten Pages.
11b.	Zeller, Doris E. Kansas Geological Survey. The Stratigraphic Succession in Kansas. Bulletin 189. (Only portions of the bulletin referring to the geomorphology of the Chase Group are included in this reference). December 1968, reprinted April 1986. Four Pages.

12. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Kansas Experiment Station. Soil Survey of Morris, County, Kansas. (Only portions of the survey referring to soil classification at the Tri-County Public Airport Site are included in this reference). November 1974. Four Pages.

13. Kansas Geological Society. Water Well Query Answer Tables for Township (T) 16 South (S), Range (R) East (E); T16S, R5E; T15S, R6E; and T15S, R5E. Information Obtained from Internet at *http://magellan.kgs.ukans.edu/WaterWell/index.html*. Also Included are Available Well Logs Obtained from the Kansas Department of Health and Environment. 25 Pages.

14. EPA Region 7 Laboratory. Transmittal of Sample Analysis Results for ASR No.: 240, Activity No.: DYXXS, Tri-County Public Airport; Summary Tables and Field Sheets. October 12, 1999. 106 Pages.

15. E&E. Trip Report with Data Summary for the Tri-County Airport Site Removal Site Evaluation, Herington, Kansas. TDD S07-9710-001. January 8, 1998. 132 pages.

16. Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation (BER). Preliminary Removal Evaluation, Latimer Ground Water Contamination Site, Latimer, Morris County, Kansas. October 1997. 121 Pages.

17. KDHE, BER. Preliminary Assessment/Screening Site Inspection, Tri-County Public Airport Site, Herington, Kansas EPA ID Number (CERCLIS) KS0001402320. May 1996.

18. Agency for Toxic Substance and Disease Registry. Toxicological Profile for Trichloroethylene. (Only portions of the profile related to the fate of trichloroethylene in the environment are included in this reference). October 1989. **Three** Pages.

19. Diekman, Faye, Member of Zion Lutheran Church, Latimer, Kansas, to J. Gadt, E&E. Telephone Personal Communication Record. January 26, 1999. One Page.

20. U.S. Census Bureau. 1990 Census Data for Morris County, Kansas. Information Obtained from Internet at *http://venus.census.gov/cdrom/lookup/951518749*. 1 Page.

21. KDHE. Letter to Clyde and Ardella Kasten Regarding Ground Water Samples. October 2, 1997. Four Pages.

22. KDHE. Letter to Vernon Jones Regarding Ground Water Samples. October 2, 1997. Five Pages.

23. KDHE. Letter to Marilyn Mattione, Tetra Tech EM, Inc, from Rob J. Beilfuss, Bureau of Water, regarding wellhead protection areas near the Herington Municipal Airport. January 10, 2000. Two Pages.

SOURCE 1 DESCRIPTION

SOURCE CHARACTERIZATION

Number of the source: 1

Source Description: Contaminated Soil

Name and description of the source: Hangar 4.

From 1950 to the early 1960s, Beech Aircraft (Beech) leased all four hangars and several other buildings at the site. Beech used the facilities for the manufacture of wing fuel dispensing tanks, steel-wing tank shipping containers, and military aircraft starter generators. In Hangar 4, Beech conducted steel-wing tank shipping container manufacturing and painting (Ref. 6a, pg 2). Beech used TCE as a solvent in a degreaser in Hangar 4. Painting compounds used by Beech included a zinc chromate primer and toluene as a thinning agent (Ref. 6a, pg 3).

The degreaser consisted of a pit about 12 feet (ft) deep, 20 ft long, and 6 ft wide (Ref. 6b, pg. 6). Solvent in the pit was heated to produce a vapor phase. Parts were lowered into the vapor phase for degreasing (Ref. 6b, pp. 6, 7). The degreaser was formerly located inside of the western hangar doors. The degreaser has been filled in and paved over with concrete (Ref. 6c, pg. 6). During the 1998 ESI, soil borings were completed inside of Hangar 4, near the former location of the degreaser. Beneath the concrete in that area, a void space was found loosely filled with gravel (Ref. 4, pg 4-1). No other information on the construction of the pit is available.

According to Raytheon, no information is available on disposal practices for the waste solvent (Ref. 6a, pg 4). A sump exists adjacent to the location of the former degreaser (Ref. 4, Fig. 3-2). During the 1998 ESI, Sample No. 106 was collected from material remaining in this sump. This sample contained TCE at 270 micrograms per kilogram (µg/kg) and cis-1,2-DCE at 15 µg/kg (Ref. 5, App. G, pp. 6, 45, 46). Drains inside of Hangar 4 empty into a drainage culvert, which empties into an open drainage ditch to the east of the hangar (Ref. 4, pp. 2-2, 4-4).

As shown in Figure 1, the 1998 ESI involved collection of soil samples from areas around and beneath Hangar 4. Samples were analyzed for organic constituents onsite using a mobile laboratory equipped with a gas chromatograph, and offsite by the EPA Region 7 laboratory for confirmation. Results of the organic analyses are summarized in Reference 4, Table 4-2, pp. 4-16 through 4-18. Only laboratory confirmation results are presented in this documentation record.

Organic compounds detected in the soil samples included TCE and cis-1,2-DCE. In samples analyzed by the EPA Region 7 laboratory, TCE concentrations ranged from 7 to 1,200 µg/kg (Ref. 4, pg. 4-7). Cis-1,2-DCE concentrations ranged from 8 to 87 µg/kg. The highest concentrations, as reported by the Region 7 laboratory, of both TCE and cis-1,2-DCE were reported in subsurface soil Sample No. 103, collected from a depth of 11 to 12 ft at Sampling Location SB77 (Ref. 4, pp. 4-7, 4-15). This sample was collected outside, southeast of Hangar 4, near where the drainage culvert discharges into an open ditch (Ref. 4, Fig 4-1). TCE and cis-1,2-DCE contamination was also documented at Sampling Location SB16A, beneath the floor at the suspected location of the former TCE degreaser, and at Sampling Location SB10, outside of the western hangar doors (Ref. 4, pp. 4-15, Fig 4-1) . No VOCs were detected in the soil samples collected from all depths from Sampling location SB-99, the background location (Ref. 4, pg. 4-7)

Location of the source, with reference to a map of the site:
As shown in Figure 2, Hangar 4 (designated H4) is located in the west portion of the TCPA Site. In this portion, an apron lies along the western side of the north-south runway. Hangar 4 is located near the southwestern end of this apron (Ref. 4, Fig. 2-2)
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SITE LOCATION MAP

A copy of the site location map is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

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Containment

The contamination around and beneath Hangar 4 was evaluated as source type "contaminated soil". No liner for the contaminated soil has been identified. Evidence that VOC contaminant migration to ground water has occurred at Source 1 is documented through sampling results at Monitoring Wells (MW) MW5, MW6, and MW6A, located at the southeastern and the northwestern corners of the hangar (Ref. 4, Fig. 3-2). These sampling results are described on pages 40 and 44 of this documentation record under Release to Ground Water. Based on 40 CFR 300, App. A, Section 3.1.2.1 and Table 3-2 a containment factor value of 10 for the ground water migration pathway has been assigned to Source 1 (Ref.1).

Release to ground water:
The presence of TCE in the Chase Group Aquifer has been documented in MW5, MW6, and MW6A, installed around Hangar 4 (Ref. 4, pp. 5-16, 5-17, Fig. 3-5). These wells were sampled during the 1998 ESI. Sample 009, collected from MW5, contained TCE at 66,000 µg/L (Ref. 5, App. G, pp. 17, 280). Sample 034, collected from MW6, contained TCE at 3,300 µg/L (Ref. 5, App. G, pp. 33, 305). Sample 021, collected from MW6A, contained TCE at 5,100 µg/L and cis-1,2-DCE at 110 µg/L (Ref. 5, App. G, pp. 27, 28, 292).

Hazardous Substances

Hazardous Substance	Sample Location (Depth bgs in ft)	Sample Number	Concentration µg/kg	Reference
Trichloroethylene	SB16A (1-2)	103	770	Ref. 5, App. G, pp. 6, 43, 187, 411
	SB16A (6-7)	104	490	Ref. 5, App. G, pp. 6, 43, 188, 411
	SB16A (13-14)	105	190	Ref. 5, App. G, pp. 6, 43, 189, 411
	SB14 (11-12)	109	110	Ref. 5, App. G, pp. 6, 45, 193, 411
	SB77 (1-2)	112	7	Ref. 5, App. G, pp. 6, 47, 196, 411
	SB77 (6-7)	113	1,100	Ref. 5, App. G, pp. 6, 47, 197, 411
	SB77 (11-12)	114	1,200	Ref. 5, App. G, pp. 6, 47, 198, 411
	SB10 (1-2)	115	11	Ref. 5, App. G, pp. 6, 47, 199, 411
	SB10 (11-12)	117	17	Ref. 5, App. G, pp. 6, 49, 201, 411
cis-1,2-Dichloroethylene	SB16A (1-2)	103	44	Ref. 5, App. G, pp. 6, 44, 187, 411
	SB16A (6-7)	104	39	Ref. 5, App. G, pp. 6, 44, 188, 411
	SB16A (13-14)	105	15	Ref. 5, App. G, pp. 6, 44, 189, 411
	SB77 (6-7)	113	22	Ref. 5, App. G, pp. 6, 48, 197, 411
	SB77 (11-12)	114	87	Ref. 5, App. G, pp. 6, 48, 198, 411
	SB10 (11-12)	117	8	Ref. 5, App. G, pp. 6, 50, 199, 411

Notes:

bgs	Below ground surface
SB	Soil boring
µg/kg	Micrograms per kilogram

Hazardous Waste Quantity

Hazardous Constituent Quantity

Insufficient information exists to calculate hazardous constituent quantity at this source.

Hazardous Substance	Constituent Quantity (pounds) (Mass - S)	Reference

sum: (pounds)

Hazardous Constituent Quantity Value (S):

Hazardous Wastestream Quantity

Insufficient information exists to calculate hazardous wastestream quantity at this source.

Hazardous Wastestream	Quantity (pounds)	Reference

sum: (pounds)

Hazardous Constituent Quantity Value (W):

Volume

Insufficient information exists to calculate volume at this source.

Dimension of source (yd^3 or gallons):

References(s):

Volume Assigned Value:

Area

The area of this source can be estimated based on three sampling locations where TCE has been documented at Source 1. These sampling locations are designated as SB10, SB14, and SB16A and represent contaminated soil beneath Hangar 4 and outside of the hangar doors. The source area is represented as a shaded triangle on Figure 1, page 7 of this documentation record. These locations inscribe a triangular area with a base of 62.5 ft and a height of 25 ft (Ref. 4, Fig 3-2). The area of this triangle, as calculated below, is 781 square ft (ft^2).

The area of a triangle is calculated as:

$$Area = 0.5 \times base \times height$$

Therefore:

$$Area = 0.5 \times 62.5\ ft \times 25\ ft = 781\ ft^2$$

A source hazardous waste quantity value for the contaminated soil is calculated below, as specified by 40 CFR 300, App. A, Table 2-5 (Ref. 1, Section 2.4.2.1.4), using the equation under Tier D of that table. The area assigned value is determined as specified by 40 CFR 300, App. A, Table 2-6 (Ref. 1, Section 2.4.2.1.4).

$$Area\ Assigned\ Value = \frac{A}{34{,}000}$$

$$Area\ Assigned\ Value = \frac{781\ ft^2}{34{,}000} = 0.023$$

Area of source (ft^2): 781

Reference(s): 4, pg 4-15, Fig. 3-2

Area Assigned Value: 0.023

SD-Source Hazardous Waste Quantity Value
Source No.: 1

Source Hazardous Waste Quantity Value

The hazardous waste quantity value is based on the area estimate for soil contamination beneath Hangar 4 and outside of the hangar doors.

Source Hazardous Waste Quantity Value: 0.023

SOURCE 2 DESCRIPTION

SOURCE CHARACTERIZATION

Number of the source: 2

Source Description: Contaminated Soil

Name and description of the source: Hangar 1.
From 1950 to early 1960s, Beech Aircraft (Beech) leased all four hangars and several other buildings at the site. Beech used the facilities for the manufacture of wing fuel dispensing tanks, steel-wing tank shipping containers, and military aircraft starter generators. In Hangar 1, Beech conducted chromium conversion coating, paint stripping, and aircraft refurbishing (Ref. 6a, pp. 2, 3). Compounds associated with the chromium-conversion-coat process line included chromic acid-based deoxidizer, alkaline cleaner solution, and a chromium-based conversion coat. The chemical used for paint stripping is unknown (Ref. 6a, pg. 3). Refurbishment involved disassembling the airplane by removing wings, engines, and landing gear. The wings were rebuilt, and wings, engines, and landing gear were shipped off site, and attached to new fuselages. The old fuselages remaining at the TCPA Site were sold as scrap (Ref. 6a, pp. 2). No chemicals were identified as associated with this process.

The chromium conversion process line consisted of a degreaser pit, a chromic acid solution deoxidizer tank, a coating tank, an alkaline clear tank, and associated rinse tanks. Beech used TCE as the solvent in the degreaser (Ref. 6a, pg 3). The degreaser was formerly situated beneath a lean-to, where the loading dock on the northern side of Hangar 1 is currently located. The degreaser pit has been filled in and paved over with concrete (Ref. 6c, pg. 6).

According to Raytheon, no information is available on disposal practices for the waste solvent (Ref. 6a, pg 4). Rinse waters and chromium solutions from the chromium-conversion coat process line in Hangar 1 were piped into in a wastewater treatment system located to the northwest of the hangar. The wastewater treatment system consisted of about three concrete-lined pits. The treatment process involved adjusting the pH of the wastewater with sulfuric acid, reducing hexavalent chromium in the wastewater with a reducing agent, and then adjusting the pH with soda ash. The composition of the reducing agent used is not known. Following settling in the last pit, treated waters would discharge to the surface and flow to the west in a drainage ditch (Ref. 6a, pg 3).

As shown in Figure 3, the 1998 ESI involved collection of soil samples from areas around Hangar 1 and beneath the loading dock on the northern side of Hangar 1. Samples were analyzed for organic and inorganic constituents. Samples were analyzed for organic constituents onsite using a mobile laboratory equipped with a gas chromatograph, and offsite by the EPA Region 7 laboratory for confirmation. Results of organic analyses are summarized in Reference 4, Table 4-2, pages 4-16 through 4-18. Only laboratory confirmation results are presented in this documentation record.

Organic compounds detected in soil samples included TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, 1,1-DCE, 1,1,2-trichloroethane, and tetrachloroethylene (PCE). The highest concentrations of these compounds were found in one of two sampling locations. Sampling location SB49, beneath the concrete adjacent to the northwestern corner of the hanger, had the highest concentrations of TCE at 2,300,000 µg/kg, cis-1,2-DCE at 140,000 µg/kg, trans-1,2-DCE at 7,700 µg/kg, vinyl chloride at 12,000 µg/kg, and 1,1-DCE at 110 µg/kg (Ref. 4, pp. 4-17, 4-18, Fig. 3-3; and Ref. 5, App. G, pp. 88, 257, 266 through 268). Sampling location SB86, also beneath the concrete adjacent to the northwestern corner of Hangar 1,

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1235 Jefferson Davis Highway
Arlington, VA 22202

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had the highest concentrations of 1,1,2-trichloroethane at 120 µg/kg, PCE at 86 µg/kg, and cis-1,2-DCE at 140,000 µg/kg (Ref. 4, pg. 4-18, Fig. 3-3; and Ref. 5, App. G, pp. 86, 89, 264, 265). No VOCs were detected in the soil samples collected from all depths from Sampling location SB-99, the background location (Ref. 4, pp. 4-7, 4-17).

Results of inorganic analyses are summarized in Reference 4, Table 4-3, pages 4-19 and 4-20. Inorganic compounds detected in soil samples include cadmium, chromium, lead, and manganese. Results were compared to a background soil sample (Sampling Location SB99) collected in the southwestern portion of the site (see Figure 2 of documentation record, pg. 8). Cadmium, chromium, lead, and manganese were found at concentrations greater than three times their background concentrations at Sampling Locations SB88, SB86, SB50A, and SB51 (Ref. 4, pg. 4-19). These samples were collected north of Hangar 1 (Ref. 4, Fig. 3-3). Beech conducted chromium conversion coating, paint stripping and aircraft refurbishing at this source (Ref. 6a, pp. 2, 3). Compounds associated with the chromium-conversion-coat process line included chromic acid-based deoxidizer, alkaline cleaner solution, and a chromium-based conversion coat. The chemical used for paint stripping is unknown (Ref. 6a, pg. 3). Because the constituents of the paint strippers, and the paint wastes are unknown and the concentrations of cadmium, lead, and manganese are so localized and elevated, these metals are included as hazardous constituents associated with the source.

Location of the source, with reference to a map of the site:
As shown in Figure 2, Hangar 1 (designated H1) is located in the west portion of the TCPA Site. In this portion, an apron lies along the western side of the north-south runway. Hangar 1 is located at the northwestern end of this apron (Ref. 4, Fig. 2-2).

Containment

The contamination around and beneath Hangar 1 was evaluated as source type “contaminated soil”. No liner for the contaminated soil has been identified. Evidence that contaminant migration has occurred at Source 2 is documented through sampling results at MW12, located north of the hangar (Ref. 4, Fig. 3-3). These sampling results are described on pages 40 and 44 of this documentation record under Release to Ground Water. Based on 40 CFR 300, App. A, Section 3.1.2.1 and Table 3-2 a containment factor value of 10 for the ground water migration pathway has been assigned to Source 2 (Ref.1).

Release to ground water
The presence of TCE; cis-1,2-DCE; and trans-1,2-DCE in the Chase Group Aquifer has been documented in monitoring wells installed around Hangar 1 (Ref. 4, pp. 5-16, Fig. 3-3). These wells were sampled during the 1998 ESI. Sample 017, collected from MW12, contained TCE, cis-1,2-DCE, and trans-1,2-DCE at 45, 11, 1.2 µg/L, respectively. (Ref. 5, App. G, pp. 25, 26, 288). Sample 018, collected from MW 12A, contained TCE at 16 µg/L (Ref. 5, App. G, pp. 25, 289).

Hazardous Substances

Hazardous Substance	Sample Location (Depth bgs in ft)	Sample Number	Concentration (µg/kg)	Reference
Trichloroethylene	SB51 (1-2)	171	6	Ref. 5, App. G, pp. 7, 83, 255, 414
	SB86 (1-2)	179	88	Ref. 5, App. G, pp. 7, 86, 263, 414
	SB86 (6-7)	180	500,000	Ref. 5, App. G, pp. 7, 86, 264, 414
	SB86 (11-12)	181	19,000	Ref. 5, App. G, pp. 7, 88, 265, 415
	SB49 (1-2)	182	2,300,000	Ref. 5, App. G, pp. 7, 88, 266, 415
	SB49 (6-7)	183	2,100,000	Ref. 5, App. G, pp. 7, 88, 267, 415
	SB49 (11-12)	184	94,000	Ref. 5, App. G, pp. 7, 88, 268, 415
	SB50A (1-2)	185	880	Ref. 5, App. G, pp. 7, 88, 269, 415
	SB50A (6-7)	186	160	Ref. 5, App. G, pp. 7, 91, 270, 415
	SB50A (11-12)	187	970	Ref. 5, App. G, pp. 8, 91, 271, 415
cis-1,2-Dichloroethylene	SB51 (6-7)	172	34	Ref. 5, App. G, pp. 7, 84, 256, 414
	SB88 (6.5-7.5)	176	2,300	Ref. 5, App. G, pp. 7, 87, 260, 414
	SB88 (11-12)	177	3,100	Ref. 5, App. G, pp. 7, 87, 261, 414
	SB86 (1-2)	179	55	Ref. 5, App. G, pp. 7, 87, 263, 414
	SB86 (6-7)	180	52,000	Ref. 5, App. G, pp. 7, 87, 264, 414
	SB86 (11-12)	181	140,000	Ref. 5, App. G, pp. 7, 89, 265, 415
	SB49 (1-2)	182	1,600	Ref. 5, App. G, pp. 7, 89, 266, 415
	SB49 (6-7)	183	4,100	Ref. 5, App. G, pp. 7, 89, 267, 415
	SB49 (11-12)	184	140,000	Ref. 5, App. G, pp. 7, 89, 268, 415
	SB50A (1-2)	185	2,500	Ref. 5, App. G, pp. 7, 89, 269, 415
	SB50A (6-7)	186	720	Ref. 5, App. G, pp. 7, 92, 270, 415
	SB50A (11-12)	187	3,700	Ref. 5, App. G, pp. 8, 92, 271, 415

Hazardous Substance	Sample Location (Depth bgs in ft)	Sample Number	Concentration (µg/kg)	Reference
trans-1,2-Dichloroethylene	SB88 (6.5-7.5)	176	880	Ref. 5, App. G, pp. 7, 86, 260, 414
	SB88 (11-12)	177	1,100	Ref. 5, App. G, pp. 7, 86, 261, 414
	SB86 (6-7)	180	1,500 J	Ref. 5, App. G, pp. 7, 86, 264, 414
	SB86 (11-12)	181	410	Ref. 5, App. G, pp. 7, 88, 265, 415
	SB49 (6-7)	183	4,200	Ref. 5, App. G, pp. 7, 88, 267, 415
	SB49 (11-12)	184	7,700	Ref. 5, App. G, pp. 7, 88, 268, 415
	SB50A (1-2)	185	56	Ref. 5, App. G, pp. 7, 88, 269, 415
	SB50A (6-7)	186	320	Ref. 5, App. G, pp. 7, 91, 270, 415
	SB50A (11-12)	187	160	Ref. 5, App. G, pp. 8, 91, 271, 415
Vinyl Chloride	SB88 (6.5-7.5)	176	6,600	Ref. 5, App. G, pp. 7, 86, 260, 414
	SB88 (11-12)	177	13,000	Ref. 5, App. G, pp. 7, 86, 261, 414
	SB86 (6-7)	180	3,500	Ref. 5, App. G, pp. 7, 86, 264, 414
	SB86 (11-12)	181	7,400	Ref. 5, App. G, pp. 7, 88, 265, 415
	SB49 (6-7)	183	5,200	Ref. 5, App. G, pp. 7, 88, 267, 415
	SB49 (11-12)	184	1,200	Ref. 5, App. G, pp. 7, 88, 268, 415
	SB50A (1-2)	185	48	Ref. 5, App. G, pp. 7, 88, 269, 415
	SB50A (6-7)	186	3,000	Ref. 5, App. G, pp. 7, 91, 270, 415
	SB50A (11-12)	187	2,600	Ref. 5, App. G, pp. 8, 91, 271, 415
1,1-Dichloroethylene	SB86 (6-7)	180	69	Ref. 5, App. G, pp. 7, 86, 264, 414
	SB86 (11-12)	181	76	Ref. 5, App. G, pp. 7, 88, 265, 415
	SB49 (11-12)	184	110	Ref. 5, App. G, pp. 7, 88, 257, 415
1,1,2-Trichloroethane	SB86 (6-7)	180	120	Ref. 5, App. G, pp. 7, 86, 264, 414
Tetrachloroethylene	SB86 (6-7)	180	86	Ref. 5, App. G, pp. 7, 86, 264, 414
Cadmium	SB51 (0-0.5)	173	1,00	Ref. 5, App. G, pp. 7, 82, 275, 414
	SB88 (1-2)	175	460	Ref. 5, App. G, pp. 7, 82, 259, 414
	SB86 (0-0.5)	178	20,000	Ref. 5, App. G, pp. 7, 85, 262, 414

Hazardous Substance	Sample Location (Depth bgs in ft)	Sample Number	Concentration (µg/kg)	Reference
	SB86 (1-2)	179	1,400	Ref. 5, App. G, pp. 7, 85, 263, 414
Cadmium (continued)	Background SB99 (0-0.5)	157	320	Ref. 5, App. G, pp. 7, 72, 241, 414
	Background SB99 (1-2)	158	250 U	Ref. 5, App. G, pp. 7, 72, 242, 414
	Background SB99 (6-7)	159	360	Ref. 5, App. G, pp. 7, 72, 243, 414
Chromium	SB51 (0-0.5)	173	83,000	Ref. 5, App. G, pp. 7, 82, 257, 414
	SB86 (0-0.5)	178	180,000	Ref. 5, App. G, pp. 7, 85, 262, 414
	Background SB99 (0-0.5)	157	16,000	Ref. 5, App. G, pp. 7, 72, 241, 414
Lead	SB51 (0.5-1)	173	270,000	Ref. 5, App. G, pp. 7, 82, 257, 414
	SB86 (0.5-1)	178	270,000	Ref. 5, App. G, pp. 7, 85, 262, 414
	SB86 (1-2)	179	1,000,000	Ref. 5, App. G, pp. 7, 85, 263, 414
	SB50A (6-7)	186	16,000	Ref. 5, App. G, pp. 7, 90, 270, 415
	Background SB99 (0-0.5)	157	18,000	Ref. 5, App. G, pp. 7, 72, 241, 414
	Background SB99 (1-2)	158	16,000	Ref. 5, App. G, pp. 7, 72, 242, 414
	Background SB99 (6-7)	159	4,800	Ref. 5, App. G, pp. 7, 72, 243, 414
Manganese	SB50A (6-7)	186	4,400,000	Ref. 5, App. G, pp. 7, 90, 270, 415
	Background SB99 (6-7)	158	360,000	Ref. 5, App. G, pp. 7, 72, 242, 414

Notes:

bgs	Below ground surface
SB	Soil boring
µg/kg	Micrograms per kilogram
U	The material was analyzed for, but was not detected. The associated numerical value is the sample detection limit (Ref. 5, App. G, pg. 10).
J	The associated numerical value is an estimated quantity (Ref. 5, App. G, pg. 10).

Hazardous Waste Quantity

Hazardous Constituent Quantity

Insufficient information exists to calculate hazardous constituent quantity at this source.

Hazardous Substance	Constituent Quantity (pounds) (Mass - S)	Reference

sum: (pounds)

Hazardous Constituent Quantity Value (S):

Hazardous Wastestream Quantity

Insufficient information exists to calculate hazardous wastestream quantity at this source.

Hazardous Wastestream	Quantity (pounds)	Reference

sum: (pounds)

Hazardous Wastestream Quantity Value (W):

Volume

Insufficient information exists to calculate volume at this source.

Dimension of source (yd^3 or gallons):

References(s):

Volume Assigned Value:

Area

The area of this source can be estimated based on five sampling locations where TCE and cis-1,2-DCE have been documented at Source 2. These sampling locations are designated as SB49, SB50A, SB51, SB88, and SB86 and represent contaminated soil outside of Hangar 1, on the northern side. The source area is represented as a shaded triangle on Figure 3, page 15 of this documentation record. These locations inscribe a triangular area with a base of 250 ft and a height of 75 ft. The area of this triangle is 9,375 ft^2.

The area (A) of a triangle is calculated as:

$$Area = 0.5 \times base \times height$$

Therefore:

$$Area = 0.5 \times 250\ ft \times 75\ ft = 9375\ ft^2$$

A source hazardous waste quality value for the contaminated soil is calculated below, as specified by 40 CFR 300, App. A Table 2-5 (Ref. 1, Section 2.4.2.1.4), using the equation under Tier D of that table.

$$Area\ Assigned\ Value = \frac{A}{34{,}000}$$

$$Area\ Assigned\ Value = \frac{9375\,ft^2}{34{,}000} = 0.276$$

Area of source (ft^2): 9,375

Reference(s): 4, pg 4-15, Fig. 3-3

Area Assigned Value: 0.276

SD-Source Hazardous Waste Quantity Value
Source No.: 2

Source Hazardous Waste Quantity Value

The hazardous waste quantity value is based on the area estimate for soil contamination on the northern side of Hangar 1.

Source Hazardous Waste Quantity Value: 0.276

SOURCE 3 DESCRIPTION

SOURCE CHARACTERIZATION

Number of the source: 3

Source Description: Contaminated Soil

Name and description of the source: Potential Burial Area (PBA)
The PBA is a roughly circular area of disturbed soil and partially exposed concrete fragments, plastic containers, and metal drums, with a depression in the center. During the ESI field work in 1997, this depression contained pond water and cattails (Ref. 4, pp. 2-5, 4-2).

Historical aerial photographs of the site, provided by Raytheon in a meeting with EPA in Region 7, show what appears to be an impoundment in the PBA (Ref. 7, pg. 4). Paint stripping wastewater from Hangar 1 were transferred to a holding pond located to the north of Hangar 1. It is unclear if this paint-stripping, waste holding pond was within the PBA or a part of the wastewater treatment system located to the west of the PBA (Ref. 9, pg. 2; Ref. 6a, pg. 3). TCE was used in a degreaser in Hangar 1 (Ref. 6a, pg. 4). Solvents, oil, and other waste from paint stripping in Hangar 1 were put into a wagon and dumped into a small pond in the PBA (Ref. 8, pp. 2, 4).

A geophysical survey conducted in February 1998 indicated that a burial area was likely present in the PBA. Both magnetometry and electromagnetic induction geophysical techniques were used to perform this survey. In the PBA, a 250- by 220-foot grid was established and surveyed. An interpretation of the data indicated that an area to the south of the pit is underlain by materials with an electromagnetic signature consistent with buried metal (Ref. 4, pg. 2-15).

The PBA was partially excavated in 1998. At this time, several of the plastic containers were determined to belong to the Carlisle Syntec Company. This company is a bonder of rubber and felt for roof underliners and currently operates in Hangar 1 with another firm (Ref. 4, pg. 2-5).

As shown in Figure 4, the 1998 ESI involved collection of soil samples around the PBA. Samples were analyzed for organic and inorganic constituents. Samples were analyzed for organic constituents onsite using a mobile laboratory equipped with a gas chromatograph, and offsite by the EPA Region 7 laboratory for confirmation. Results of organic analyses are summarized in Reference 4, Table 4-2, pages 4-16 through 4-18. Only laboratory confirmation results are presented in this documentation record.

Organic compounds detected in soil samples included TCE and cis-1,2-DCE. TCE concentrations ranged from 10 to 23 µg/kg. The highest concentration of TCE was detected at a depth of 14 to 15 ft below ground surface (bgs) (Sampling Location SB57, sample no. 164) (Ref. 4, pp. 4-15, Fig. 3-4; Ref. 5, App. G, pp.77, 248). Cis-1,2-DCE concentrations ranged from 16 to 420 µg/kg. The highest concentrations of cis-1,2-DCE at the PBA were found at a depth of 11 to 12 ft bgs at sampling location SB57 (Ref. 4, pp. 4-15, Fig. 3-4; Ref. 5, App. G, pp. 78, 247). No VOCs were detected in the soil samples collected from all depths from Sampling location SB-99, the background location (Ref. 4, pg. 4-7)

Results of inorganic analyses are summarized in Reference 4, Table 4-3, pages 4-19 and 4-20. Inorganic compounds detected in soil samples include cadmium, chromium, and lead. Results were compared to a background sample (Soil Sampling Location S99) collected in the southwestern portion of the site (Ref. 4, Fig. 3-1). Cadmium, chromium, and lead were found at concentrations greater than three times their background concentrations at Sampling Location SS1. This sample was collected at the northern edge of the depression in the PBA (Ref. 4, Fig. 3-4).

SITE LOCATION MAP

A copy of the site location map is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

Paint stripping wastewater from Hangar 1 were transferred to a holding pond located to the north of Hangar 1. It is unclear if this paint-stripping, waste holding pond was within the PBA or a part of the wastewater treatment system located to the west of the PBA (Ref. 9, pg. 2; Ref. 6a, pg. 3). Solvents, oil, and other waste from paint stripping in Hangar 1 were put into a wagon and dumped into a small pond in the PBA (Ref. 8, pp. 2, 4). The chemical used for paint stripping is unknown (Ref. 6a, pg. 3). Because the constituents of the paint strippers, and the paint wastes are unknown and the concentrations of cadmium, chromium, and lead are so localized and elevated, these metals are included as hazardous constituents associated with the source.

The PBA is part of a larger area which was previously used for washing airplanes. Only limited information is available for this airplane wash rack area (Ref. 10, pg.1-16, Fig. 1-9). Soil samples were collected in the wash rack area during the USACE SI and ESI, but the samples were only analyzed for total petroleum hydrocarbons. Therefore, these sampling results will not be discussed further.

Location of the source, with reference to a map of the site:
As shown in Figure 2, the PBA is located about 500 ft north of Hangar 1, in the western portion of the TCPA site. In this portion, an apron lies along the western side of the north-south runway. Hangar 1 and the PBA are located at the northwestern end of this apron (Ref. 4, Fig. 2-2) .

Containment
The contamination at the PBA was evaluated as source type “contaminated soil”. No liner for the contaminated soil has been identified. Evidence that contaminant migration has occurred at Source 3 is documented through sampling results at MW13, located within the PBA (Ref. 4, Fig. 3-4). These sampling results are described on pages 40 and 44 of this documentation record under Release to Ground Water. Based on 40 CFR 300, App. A, Section 3.1.2.1 and Table 3-2 a containment factor value of 10 for the ground water migration pathway has been assigned to Source 3 (Ref.1).

Release to ground water
The presence of TCE and cis-1,2-DCE in the Chase Group Aquifer has been documented in MW-13, installed in the PBA (Ref. 4, pp. 5-17, Fig. 3-5). This well was sampled during the 1998 ESI. Sample 036, collected from MW13, contained TCE at 67 and cis-1,2-DCE at 18 µg/L, respectively. (Ref. 5, App. G, pp. 37, 38, 307).

Hazardous Substances

Hazardous Substance	Sample Location (Depth in ft bgs)	Sample Number	Concentration (µg/kg)	Reference
Trichloroethylene	SB57 (14-15)	164	23	Ref. 5, App. G, pp. 7, 77, 248, 414
	SB81 (6-7)	166	10	Ref. 5, App. G, pp. 7, 80, 250, 414
	DD8 (1-2)	133	24	Ref. 5, App. G, pp. 7, 57, 217, 412
cis-1,2-Dichloroethylene	SB57 (6-7)	162	16	Ref. 5, App. G, pp. 7, 78, 246, 414
	SB57 (11-12)	163	420	Ref. 5, App. G, pp. 7, 78, 247, 414
	SB57 (14-15)	164	230	Ref. 5, App. G, pp. 7, 78, 248, 414
	SB81 (6-7)	166	30	Ref. 5, App. G, pp. 7, 81, 250, 414
	SB81 (12-13)	167	160	Ref. 5, App. G, pp. 7, 81, 251, 414
Cadmium	SS1 (0.5-1.5)	188	48,000	Ref. 5, App. G, pp. 8, 90, 272, 415
	Background SB99 (0-0.5)	157	320	Ref. 5, App. G, pp. 7, 72, 241, 414
Chromium	SS1 (0.5-1.5)	188	1,200,000	Ref. 5, App. G, pp. 8, 90, 272, 415
	Background SB99 (0-0.5)	157	16,000	Ref. 5, App. G, pp. 7, 72, 241, 414
Lead	SS1 (0.5-1.5)	188	310,000	Ref. 5, App. G, pp. 8, 90, 272, 415
	Background SB99 (0-0.5)	157	18,000	Ref. 5, App. G, pp. 7, 72, 241, 414

Notes:

bgs Below ground surface
SB Soil boring
µg/kg Micrograms per kilogram

Hazardous Waste Quantity

Hazardous Constituent Quantity

Insufficient information exists to calculate hazardous constituent quantity at this source.

Hazardous Substance	Constituent Quantity (pounds) (Mass - S)	Reference
sum:	(pounds)	

Hazardous Constituent Quantity Value (S):

Hazardous Wastestream Quantity

Insufficient information exists to calculate hazardous wastestream quantity at this source.

Hazardous Wastestream	Quantity (pounds)	Reference
sum:	(pounds)	

Hazardous Wastestream Quantity Value (W):

Volume

Insufficient information exists to calculate volume at this source.

Dimension of Source (yd^3 or gallons):

References(s):

Volume Assigned Value:

Area

The area of this source can be estimated based on three sampling locations where TCE and cis-1,2-DCE have been documented at Source 3. These sampling locations are designated as SB57, SB81, and DD8 and represent contaminated soil at the PBA. The source area is represented as a shaded triangle on Figure 4, page 24 of this documentation record. These locations inscribe a triangular area with a base of 112.5 ft and a height of 62.5 ft (Ref. 4, Fig 3-4). The area of this triangle is 3,516 ft^2. Metal contaminants (lead, cadmium, and chromium) were documented at a single location, SS1, that is outside of this area. Therefore, sampling location SS1 was not included in the area calculation below.

The area (A) of a triangle is calculated as:

$$Area = 0.5 \times base \times height$$

Therefore:

$$Area = 0.5 \times 112.5\ ft \times 62.5\ ft = 3516\ ft^2$$

The source hazardous waste quality value for the contaminated soil is calculated below, as specified by 40 CFR 300, App. A, Table 2-5 (Ref. 1, Section 2.4.2.1.4), using the equation under Tier D of that table.

$$Area\ Assigned\ Value = \frac{A}{34{,}000}$$

$$Area\ Assigned\ Value = \frac{3{,}516\ ft^2}{34{,}000} = 0.103$$

Area of source (ft^2): 3,516

Reference(s): 4, pg 4-15, Fig. 3-4

Area Assigned Value: 0.103

SD-Source Hazardous Waste Quantity Value
Source Number: 3

Source Hazardous Waste Quantity Value

The hazardous waste quantity value is based on the area estimate for soil contamination at the PBA.

Source Hazardous Waste Quantity Value: 0.104

SITE SUMMARY OF SOURCE DESCRIPTIONS

Source Number	Source Hazardous Waste Quantity Value	Containment			
		Ground Water	Surface Water	Air Gas	Air Particulate
1	0.023	10	NS	NS	NS
2	0.276	10	NS	NS	NS
3	0.103	10	NS	NS	NS
Total	0.402				

NS = Not scored

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

The TCPA Site area lies within the Flint Hills Uplands section of the Central Lowland physiographic provence (Ref. 4, pg. 5-1; and Ref. 10, pg. 1-3). Elevations across the site range from about 1,490 feet above mean sea level (amsl) near the water tank at the southern end of the site to about 1,440 feet amsl near an unnamed intermittent creek at the northern end of the site (Ref. 3). The regional geology has been characterized as a relatively thin veneer (5 to 50 feet) of unconsolidated Pleistocene and Holocene (recent) age deposits overlying about 2,500 feet of relatively flat-lying to slightly westward-dipping Permian- through Cambrian-age sedimentary strata, which in turn overlie Precambrian age basement rocks (Ref. 10, pg 1-4). The unconsolidated surface material in the area of the site has been described as loess deposits of the Pleistocene-age Sanborn Formation (Ref. 12, pg. 47, Sheet 20). Loess deposits typically consist of silt- and clay-sized particles (Ref. 11a, pg. 22; 10, pg. 1-4). Investigations indicate that soil and unconsolidated deposit thickness on the site range from 0.5 to 17 feet (Ref. 10, pg. 1-7).

In the region encompassing the TCPA Site, the uppermost bedrock units have been mapped as limestones and shales of the Permian-age Chase Group (Ref. 10, pg. 1-5, Fig. 1-6; Ref. 4, pp. 5-1, 5-2, Fig. 5-1). The Chase Group has a reported thickness of 350 feet in Morris County (Ref. 10, pg. 1-5). Regionally, these shale and limestone units dip to the northwest at approximately 0.14 degree and have a northeast strike (Ref. 4, pg. 5-4, Fig. 5-2, 5-3, 5-4, 5-5). The upper five formations of the group (Nolans Limestone, Odell Shale, Winfield Limestone, Doyle Shale, and Barnstone Limestone) are described below in descending order.

At the TCPA Site, subsurface borings have been installed and logged, and monitoring wells have been installed down to the Towanda Limestone Member of the Doyle Shale Formation (Ref. 4, Fig. 5-1, 5-2). The Towanda Limestone Member is encountered at a depth of 121 to 135 feet bgs or an elevation of about 1,372 to 1,348 feet amsl (Ref. 4, Fig. 5-2). At the site, the eight water supply wells, installed during base operations, were completed at total depths of about 180 to 200 feet bgs and were screened in "broken" limestones from about 160 to 200 feet bgs (Ref. 10, pg. 1-12). According to the USACE ESI for the site, these water supply wells, as well as a private water supply well, are screened in the Fort Riley Limestone Member of the Barnstone Limestone Formation (Ref. 10, pp. 1-11, 1-12, Fig. 1-7).

Regionally, ground water is obtained primarily from fractured limestone bedrock aquifers within the Chase Group (Ref. 4, pg. 5-4). Well records from the Kansas Geological Survey (limited to wells installed after 1976) indicate that wells in the area of the site obtain water from depths of 64 to 172 feet (Ref. 13, pp. 2, 16).

Aquifer/Stratum 1 (shallowest)

Aquifer/Stratum Name: Nolans Limestone

Description: The Nolans Limestone consists of the Herington Limestone, Paddock Shale, and Krider Limestone Members (Ref. 10, pg. 1-8; 11a, pg. 20; 11b, pp. 49, 50). The Herington Limestone is fossiliferous, slightly dolomitic, and massively bedded, with cauliflower-like masses of chert and quartz (Ref. 10, pg. 1-8; Ref. 4, pg. 5-1; 11b, pg. 50). The Herington Limestone has been removed by erosion over portions of the site; where it is present, it is only 2 to 5 feet thick (Ref. 4, pg. 5-3). The Paddock Shale consists of tan to gray shale, with a fossiliferous limestone unit at the base (Ref. 10, pg. 1-8; Ref. 4, pg. 5-1; 11a, pg. 20). The Paddock Shale is 12 to 15 feet thick, contains diagonal fractures at some locations, and is absent at the northern and southern ends of the site where the elevation is lower (Ref. 4, pg. 5-3, Fig. 5-2). The Krider Limestone consists of two yellowish-brown limestone beds separated by a thin shale unit and is 1 to 1.5 feet thick at the site

(Ref. 4, pg. 5-3; 11b, pg. 49). The total thickness of the Nolans Limestone ranges from 22 to 40 feet (Ref. 4, pg. 5-1; 11b, pg. 49). At the site, the Nolans Limestone was found to be about 23 feet thick at MW-4 (Ref. 4, App. B. pp. 4, 5). Across the site, the Nolans Limestone formation extends to an elevation of about 1,465 feet amsl.

References: Ref. 4, pp. 5-1, 5-3, Fig. 5-2, App. B pp. 4, 5; and Ref. 10, pp. 1-8, 1-9; 11b, pp. 49, 50; 11a, pp. 20, 21.

Aquifer/Stratum 2

Aquifer/Stratum Name: Odell Shale

Description: The Odell Shale is identified below the Nolans Limestone by its reddish to red-brown shale units (Ref. 10, pg. 1-9). The Odell Shale is composed primarily of maroon and green shale units, with minor gray and yellow shales (Ref. 4, pg. 5-3; 11a, pg. 20). The thickness of the Odell Shale was found to vary between 20.5 feet thick at MW-6 to 14.1 feet thick at MW- 4 (Ref. 4, App. B pp. 5, 20, 21). On the northern and southern ends of the site, the Odell Shale was overlain by surficial overburden, and the thickness encountered indicated that it had been partially eroded and weathered (Ref. 4, pg. 5-3, Fig. 5-2). Across the site, the Odell Shale formation extends from an elevation of about 1,465 feet amsl down to 1,450 feet amsl (Ref. 4, Fig. 5-2).

References: Ref. 4, pp. 5-2, 5-3, Fig. 5-2, App. B pp. 5, 20, 21; Ref. 10, pg. 1-9; 11a, pg. 20.

Aquifer/Stratum 3

Aquifer/Stratum Name: Winfield Limestone

Description: The Winfield Limestone underlies the Odell Shale and consists of the Cresswell Limestone, Grant Shale, and Stovall Limestone Members (Ref. 10, pg. 1-9; 11a, pp. 18, 19). The total thickness of the group is reported to be 25 feet (Ref. 10, pg. 1-9; 11b, pg. 49). The Cresswell Limestone Member is a massive fossiliferous limestone unit, with characteristic cavernous weathering, and obtains a maximum thickness of 25 feet (Ref. 4, pg. 5-2; 11b, pg. 49). The Grant Shale consists of gray, calcareous, fossiliferous shale and is about 12 feet thick at the site (Ref. 4, pp. 5-2, 5-3, Fig. 5-2; 11b, pg. 49). The Stovell Limestone is a dense, gray limestone, with an abundance of chert, and has a thickness ranging from 0.3 to 2.7 feet (Ref. 4, pg. 5-2; 11b, pg. 49; 11a, pg. 19). Across the site, the Winfield Limestone formation extends from an elevation of about 1,450 down to 1,410 feet amsl (Ref. 4, Fig. 5-2).

The two limestone members of this formation (Cresswell and Stovall) are water-bearing and occur where many of the monitoring wells located at the facility are screened (Ref. 4, pp. 5-5, 5-6, Table 5-1).

References: Ref. 4, pp. 5-2, 5-3, 5-5, 5-6, Table 5-1, Fig. 5-2; and Ref. 10, pp. 1-9, 1-10; 11b, pg. 49; 11a, pp. 18-20.

Aquifer/Stratum 4

Aquifer/Stratum Name: Doyle Shale

Description: The Doyle Shale Formation of the Permian-age Chase Group consists of two shale members separated by a limestone member and may be as much as 70 feet thick, but averages 37 feet in Morris County (Ref. 10, pg. 1-10; 11b, pg.

49; 11a, pg. 18). The uppermost unit is the Gage Shale, which consists primarily of a noncalcarious, multicolored shale, with some fossiliferous shales in the upper part (Ref. 10, pg. 1-11; Ref. 4, pg. 5-2; and 11b, pg. 49). At the site, the Gage Shale was measured to be about 40 feet thick (Ref. 4, pg. 5-3, Fig. 5-2). Underlying the Gage Shale is the Towanda Limestone, which is composed of a bluish-gray to yellow, slabby, platy limestone that is commonly brecciated in the upper portion (11b, pg. 49). The thickness of the Towanda Member ranges from 5 to 15 feet and was measured at 12 feet thick at the site (Ref. 4, pp. 5-2, 5-3; 11b, pg. 49). The Towanda Member is underlain by the Holmesville Member, which consists of a multi-colored, nonfossiliferous, shale interbedded argillaceous limestone and is reported to be 16 feet thick (Ref. 10, pg. 1-11; and Ref. 4, pg. 5-2; 11a, pg. 18). The Holmesville Shale was not fully penetrated during the ESI (Ref. 4, pp. 5-3 and 5-4). Across the site, the Doyle Shale Formation extends from an elevation of about 1,410 down to at least 1,350 feet amsl (Ref. 4, Fig. 5-2).

The Towanda limestone member of this formation is water-bearing and occurs where several of the monitoring wells located at the facility are screened, as well as many of the domestic wells (Ref. 4, pp. 5-6, 5-7, Table 5-1).

References: Ref. 4, pp. 5-2 - 5-7, Fig. 5-2; Ref. 10, pp. 1-10, 1-11; 11b, pg. 49; and 11a, pg. 18

Aquifer/Stratum 5 (deepest)

Aquifer/Stratum Name: Barnstone Limestone

Description: The Barnestone Limestone Formation of the Permian-age Chase Group is composed of three members (Ref. 10, pg. 1-11; 4, pg. 5-2; and 11a, pg. 16). The uppermost member is the Fort Riley Limestone Member, which in Morris County consists of about 67 feet of light gray to tan, massive- to thin-bedded limestone, with a minor amount of shale (Ref. 11a, pp. 17, 18). Beneath the Fort Riley Member lies the Oketo Shale Member, which is composed of a calcareous, gray shale, and averages less than five feet thick but can be locally absent in parts of Morris County (11b, pg. 48). The lowermost member of the Barnestone Formation is the Florence Limestone Member, which consists of primarily light to yellowish-gray, limestone, with abundant chert nodules and minor shale, and having a thickness of 12 to 45 feet (Ref. 10, pg. 1-12; Ref. 4, pg. 5-2; and 11b, pg. 48). Across the site, the Barnstone Limestone Formation extends from an approximate elevation of 1,340 down to 1,270 feet amsl (Ref. 4, Figs. 5-1, 5-2).

Water supply wells and several private wells are believed to be screened in the Fort Riley Member (Ref. 10, pg. 1-12, Fig. 1-7).

References: Ref. 4, pg. 5-2, Figs. 5-1, 5-2; Ref. 10, pg. 1-11, Fig. 1-7; 11a, pp. 16 - 18; and 11b, pp. 48, 49.

These units and water-bearing limestones are evaluated as a single hydrologic unit. The most compelling reason for interconnecting the units is the fact that chlorinated solvent contamination has migrated across the shale units, separating the limestones (Ref. 4, pp. 5-13 through 5-17). Recently, collected samples have shown that WSW No. 1, located south of hangar 4, contains contamination (Ref. 14, pp. 31, 35, 103). Well WSW No. 1 is thought to be screened in the deepest water-bearing zone of the Chase Group (Ref. 10, pg. 1-12, Fig. 1-7). Well logs of private wells also indicate that the wells are screened or constructed with gravel packs extending across the water-bearing formations. The nearest contaminated private water supply well, the Clyde Kasten well, is completed to a depth of 130 feet (screened from 110 to 130 feet in Fort Riley Limestone), but the gravel filter pack extends to within 24 feet of the ground surface (Ref. 4, pg. 5-7; and Ref. 13, pp. 7, 13; and Ref. 10, Fig 1-7). In accordance with 40 CFR 300, App. A, Section 3.0.1.2, the aquifers are combined into a single hydrologic unit (Ref. 1).

3.1 LIKELIHOOD OF RELEASE

3.1.1 Observed Release

Aquifer Being Evaluated: Chase Group (Cresswell, Stovall, Towanda, and Fort Riley Limestones)

An observed release by chemical analysis is documented to the Chase Group Members, as described below.

Chemical Analysis:

- Background Concentration

As part of the 1997 removal site evaluation, EPA conducted private well sampling in the community of Latimer, Kansas and the surrounding area adjacent to the TCPA facility (Ref. 15, pg. 1). As part of this sampling effort, two private wells (sample numbers 033 and 036) located approximately ½ mile south, southwest of the TCPA facility and one private well (sample number 032) located approximately 1 mile northeast of the TCPA facility were sampled (Ref. 15, pg. 14). Groundwater flow in the area in toward the northwest (Ref. 4, pp. 5-5 through 5-7, 5-13, Figures 5-6, 5-7, 5-8). Because these private wells are located hydrologically upgradient and side gradient of the TCPA facility, they were chosen as representative of background groundwater conditions.

As part of the 1998 ESI, three nested wells (one in each aquifer that was evaluated) were installed at a background location cross-gradient and away from the potential sources in order to provide background ground water quality (Ref. 4, pg. 3-8). These wells, shown in Figure 5, were designated MW-4 (screened in the Cresswell Limestone), MW-4A (screened in the Stovall Limestone), and MW-4B (screened in the Towanda Limestone) (Ref. 4, pp. 3-8, 3-9). Also as part of the ESI, three private wells located south and southwest of the site were sampled (Ref. 4, pg. 3-30, Fig. 5-13). The location of these background monitoring wells are shown on Figure 5, page 35, of this documentation record.

In October 1999, another round of spring water, monitoring well, and water supply well sampling was conducted by EPA (Ref. 14, pp. 2, 3, 4). Background monitoring wells 4, 4a, and 4b were sampled as well as 2 of the three background private wells sampled in 1998 (Ref. 15, pp. 3, 4, 34, 35).

BACKGROUND GROUND WATER SAMPLES

Sample ID	Depth (Screen Interval) Feet BTOC (Elevation- feet amsl)	Date (Sample Number)	Reference
MW-4	49.63 - 69.93 (1,446.52 - 1,426.22)	09-02-98 (AZXXS-039)	4, App. B pp. 4 to 6; and 5, App. G pg. 310
		09-07-99 (DYXXS-001)	14, pp. 3, 34, 41
MW-4A	80.42 - 85.45 (1,415.96 - 1,410.93)	09-02-98 (AZXXS-038)	4, App. B pp. 7 to 10; and 5, App. G pg. 309
		09-07-99 (DYXXS-002)	14, pp. 3, 34, 42

BACKGROUND GROUND WATER SAMPLES

Sample ID	Depth (Screen Interval) Feet BTOC (Elevation- feet amsl)	Date (Sample Number)	Reference
MW-4B	126.28 - 136.31 (1,370.09 - 1,360.06)	09-02-98 (AZXXS-037)	4, App. B pp. 11 to 16; and 5, App. G pg. 308
		09-07-99 (DYXXS-003)	14, pp. 3, 34, 43
Jerry Paige	84 - 104 [a, b]	10-06-97 (AYXXS-032)	15, pp. 14, 21, 24, 30, 83, 84; Ref. 13, pp. 7, 12
Marie Miller	NA	10-06-97 (AYXXS-033)	15, pp. 14, 21, 24, 30, 85, 86
Merrill Welch	70	10-06-97 (AYXXS-036)	15, pp. 14, 22, 24, 30, 91, 92
Randy Wittman	93 - 129 [b, c]	09-02-98 (AZXXS-332)	5, App. G, pg. 375; and 13, pg. 17
		09-08-99 (DYXXS-309)	14, pp. 4, 35, 97
Jim Johnson	85 - 140 [b]	09-02-98 (AZXXS-333)	5, App. G, pg. 376; and 13, pg. 23
Kenneth Johnson	85 - 135 [b]	09-02-98 (AZXXS-334)	5, App. G, pg. 377; and 13, pg. 24
		09-08-99 (DYXXS-310)	14, pp. 4, 35, 98

[a] Based on the location shown for the Jerry Paige well (Ref. 15, pp.14, 21), and the topographic map (Ref. 3), the well is in the SW ¼ of the SW ¼ of the NW ¼ of Section 29, Township 15 South, Range 6 East. The well record for the Billy Paige well log (Ref. 13, pg. 12) indicates this is the Jerry Paige well.

[b] Screen elevations for private wells are not available.

[C] Based on the location shown for the Whittman well (Ref. 4, pg. 5-20, Fig. 5-13), and the location of the well record for the K. Herpich well log (Ref. 13, pg. 17), it is believed that these wells are the same.

AMSL Above mean sea level

BTOC Below the top of the well casing

SITE LOCATION MAP

A copy of the site location map is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

The table below summarizes the analytical results for samples collected from the background wells defined above. The solvents TCE and cis-1,2-DCE were not positively identified in any of the background wells selected. TCE is a man-made chemical that does not occur naturally in the environment (Ref. 18, pg. 1) and it is therefore not expected in background wells.

BACKGROUND GROUND WATER CONCENTRATIONS

Sample ID	Date (Sample No.)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit [a] (µg/L)	Reference
MW-4	09-02-98 (AZXXS-039)	TCE PCE cis-1,2-DCE trans-1,2-DCE Cadmium (diss.) Lead (diss.) Manganese (diss.)	ND ND ND ND ND ND ND	1.0 1.0 2.0 1.0 1.0 1.0 1.0	4, pp. 5-16, 5-18; and 5, App. G, pp. 6, 10, 36, 37, 38, 418
	09-07-99 (DYXXS-001)	TCE	ND	0.54	14, pp. 2, 3, 6, 34, 41
MW-4A	09-02-98 (AZXXS-038)	TCE PCE cis-1,2-DCE trans-1,2-DCE	ND ND ND ND	1.0 1.0 2.0 1.0	4, pp. 5-16, 5-18; and 5, App. G, pp. 6, 10, 37, 38, 418
	09-07-99 (DYXXS-002)	TCE	ND	0.54	14, pp. 2, 3, 6, 34, 42
MW-4B	09-02-98 (AZXXS-037)	TCE PCE cis-1,2-DCE trans-1,2-DCE	ND ND ND ND	1.0 1.0 2.0 1.0	4, pg. 5-16; and 5, App. G pp. 6, 10, 37, 38, 418
	09-07-99 (DYXXS-003)	TCE	ND	0.54	14, pp. 2, 3, 6, 34, 43
Jerry Paige	10-06-97 (AYXXS-032)	TCE cis-1,2-DCE	ND ND	1.0 1.0	15, pp.30, 83, 84, 112, 113, 126, 127
Marie Miller	10-06-97 (AYXXS-033)	TCE cis-1,2-DCE	ND ND	1.0 1.0	15, pp. 30, 85, 86, 112, 113, 126, 127
Merrill Welch	10-06-97 (AYXXS-036)	TCE cis-1,2-DCE	ND ND	1.0 1.0	15, pp. 30, 91, 92, 112, 113, 126, 127
Randy Wittman	09-02-98 (AZXXS-332)	TCE PCE cis-1,2-DCE trans-1,2-DCE	ND ND ND ND	0.05 0.05 0.05 0.05	4, pg. 5-20; and 5, App. G pp. 9, 10, 125, 126, 421
	09-08-99 (DYXXS-309)	TCE	ND	0.05	14, pp. 2, 4, 29, 35, 97

BACKGROUND GROUND WATER CONCENTRATIONS

Sample ID	Date (Sample No.)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit [a] (µg/L)	Reference
Jim Johnson	09-02-98 (AZXXS-333)	TCE PCE cis-1,2-DCE trans-1,2-DCE	ND ND ND ND	0.05 0.05 0.05 0.05	4, pg. 5-20; and 5, App. G pp. 9, 10, 125, 126, 421
Kenneth Johnson	09-02-98 (AZXXS-334)	TCE PCE cis-1,2-DCE trans-1,2-DCE	ND ND ND ND	0.05 0.05 0.05 0.05	4, pg. 5-21; and 5, App. G, pp. 9, 10, 128, 129
	09-08-99 (DYXXS-310)	TCE	ND	0.05	14, pp. 2, 4, 29, 35, 98

Notes:

a For the 1998 and 1999 data, the sample detection limits were reported by the laboratory when the analyte was not detected and qualified by a "U" code (Ref. 5, App. G, pg. 10; Ref. 14, pg. 2). For the 1997 data, the samples were qualified with a "K" code indicating the actual sample concentration was less than the value reported (Ref. 15, pg. 113).

µg/L	Micrograms per liter	TCE	Trichloroethylene
cis-1,2-DCE	cis-1,2-Dichloroethylene	trans-1,2-DCE	trans-1,2-Dichloroethylene
(diss.)	Dissolved	PCE	Tetrachloroetylene
ND	Not detected		

- Contaminated Samples

Numerous monitoring well and residential well samples contained contaminants at concentrations significantly above background and above MCLs or other health-based benchmarks for drinking water. During the 1998 ESI, ground water samples were collected from 40 monitoring wells located both on the facility and off the facility (Ref. 4, pg. 3-7, Table 3-3, Fig. 5-6, 5-7, 5-8). In addition, 46 private water supply wells were sampled. TCE was reported in 31 of the monitoring wells and 25 of the private water supply wells that were sampled (Ref. 4, pp. 5-8, 5-12, Tables 5-1, 5-4). Sample analysis was performed by the EPA Region 7 laboratory (Ref. 4, pp. 3-15, 3-19). Private water supply wells were analyzed for drinking water VOCs (Ref. 4, pp. 3-29, 3-30). Samples from monitoring wells were all analyzed for lower detection limit VOCs; a limited number of monitoring well samples were also analyzed for total and dissolved metals, cyanide, perchlorate, and stoddard solvents (Ref. 4, pp. 3-26, 3-27). A follow-up ground water sampling event was conducted in the fall of 1999. Ground water samples were collected from 41 monitoring wells and 15 private supply wells and were analyzed by the EPA Region 7 laboratory for VOCs (Ref. 14, pp. 1, 34, 35).

A removal site evaluation was conducted in the fall of 1997 (Ref. 15). As part of the removal assessment, EPA and its contractor sampled ground water from private water supply wells in the town of Latimer, Kansas, and between the town and the TCPA Site to the southwest. A total of 43 ground water samples, two trip blanks and one field blank were submitted to the EPA Region 7 laboratory for VOC analysis (Ref. 15, pp. 4, 5). TCE was reported in 23 of the private wells sampled (Ref. 15, pg. 7). Private well sampling locations are shown in Figures 2 and 3 of the trip report (Ref. 15, pp.12, 14).

A preliminary removal evaluation (PRE) was also conducted in the fall of 1997 by the Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation (BER) (Ref. 16). As part of this evaluation, ground water sampling was conducted at 37 private wells in and around the town of Latimer (Ref.16, pp. 5, 40). KDHE's focus in the PRE was on the source of carbon tetrachloride and ethylene dibromide (EDB) in drinking water wells in the Town of Latimer (Ref. 16, pp. 5, 9; and Ref. 4, pp. 2-12, 2-13). According to KDHE, the source of carbon tetrachloride and EDB in ground water is related to grain fumigants applied at grain storage facilities in Latimer (Ref. 16, pp. 9, 13). The carbon tetrachloride contamination of the wells in Latimer is not associated with any of the sources defined for the TCPA Site. Carbon tetrachloride and EDB contamination of the wells will therefore not be included as hazardous substances associated with the TCPA Site and will not be included in the contaminated ground water samples table beginning on page 38 of this documentation record. The KDHE PRE report is included as a reference, because it provides additional documentation of TCE and cis-1,2-DCE contamination of the private well to the northwest of the TCPA Site (Ref. 16, pp. 19, 23). TCE results in the wells were on the same order of magnitude as the samples collected by EPA during the removal assessment (Ref. 4, pg. 2-13; and Ref. 16, pp. 5, 54 through 80).

A preliminary assessment/screening site inspection (PA/SSI) was conducted in the spring of 1996 by KDHE BER (Ref. 17). As part of this assessment, ground water sampling was conducted at five monitoring wells at the facility and the primary water supply well (Ref. 17, pp. 4, 7). Ground water samples were analyzed by the Kansas Health and Environmental Laboratory for VOCs (Ref. 17, pg. 4). The state reported TCE contamination in Water Supply Well 1 at a concentration of 84.4µg/L (Ref. 17, Table 2). It was later determined that the state may not have sampled the water supply well, but instead a plastic pipe located adjacent to the water supply well (Ref. 4, pg. 2-11). Because of this uncertainly, this sample is not included below as a contaminated sample.

Many of the private wells and monitoring wells have been sampled more than one time. For the sake of brevity, not every monitoring well in which TCE was detected is included below. Rather, monitoring wells were selected based on the

concentration of contaminants found in samples, the depth (or geologic member) the well was completed in, and the distance from the site. All contaminated private water supply wells sampled by EPA are presented in the following table.

CONTAMINATED GROUND WATER SAMPLES

Sample ID	Depth (screen interval) Depth Below TOC (elevation- feet amsl)	Date (Sample Number)	Reference
MW-5	41.35 - 61.65 (1,452.32 - 1,432.02)	09-02-98 (AZXXS-009)	4, pg. 3-25; and 5, App. G pg. 280
MW-6	47.09 - 67.39 (1,446.65 - 1,426.35)	09-02-98 (AZXXS-034)	4, pg. 3-25; and 5, App. G pg. 305
MW-12	43.86 - 64.16 (1,441.54 - 1,421.24)	09-03-98 (AZXXS-017)	4, pg. 3-25; and 5, App. G pg. 288
MW-13	34.92 - 52.22 (1,441.98 - 1,421.68)	09-02-98 (AZXXS-036)	4, pg. 3-25; and 5, App. G pg. 307
MW-17	12.87 - 33.17 (1,438.60 - 1,418.30)	09-03-98 (AZXXS-013)	4, pg. 3-25; and 5, App. G pg. 284
MW-6A	79.00 - 84.03 (1,414.54 - 1,409.51)	08-31-98 (AZXXS-021)	4, pg. 3-25; and 5, App. G pg. 292
MW-17B	92.57 -102.60 (1,358.08 - 1,348.05)	09-03-98 (AZXXS-016)	4, pg. 3-25; and 5, App. G pg. 287
WSW No. 1	180 - 200[a] 175.13	09-08-99 (DYXXS-315)	10, pg. 1-12; and 14, pp. 31, 35, 103
D. Farres; W. Ohm 114 2nd St. Latimer, KS	NA	08/31/98 (AZXXS-303)	4, pg. 3-29, Fig. 5-14; and 5, App. G pg. 346
		10/06/97 (AYXXS- 005)	15, pp.12, 20, 24, 38
R. Diekman 212 North St. Latimer, KS	65	08/31/98 (AZXXS-304)	4, pg. 3-29, Fig. 5-14; and 5, App. G pg. 347
		10/06/97 (AYXXS-002)	15, pp.12, 20, 33, 34
Zion Lutheran Church Latimer, KS	95	08/31/98 (AZXXS-305)	4, pg. 3-29, Fig. 5-14; and 5, App. G pg. 348
		10/06/97 (AYXXS-003)	15, pp.12, 20, 35, 36
B. Diekman 111 Main St. Latimer, KS	NA	08/31/98 (AZXXS-306)	4, pg. 3-29, Fig. 5-14; and 5, App. G pg. 349
		10/06/97 (AYXXS-014)	15, pp.12, 20, 54, 55

CONTAMINATED GROUND WATER SAMPLES
(Continued)

Sample ID	Depth (screen interval) Depth Below TOC (elevation- feet amsl)	Date (Sample Number)	Reference
D. Wendt 2615 W. Hwy. 4 White City, KS	90	08/31/99 (AZXXS-312)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 355
		10/07/97 (AYXXS-025)	15, pp.14, 21 72, 73
W. Kasten 2649 W. Hwy. 4 White City, KS	110	08/31/98 (AZXXS-313)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 356
		10/06/97 (AYXXS-031)	15, pp.14, 31, 81, 81
R. Harlow 106 Kasten Latimer, KS	~90 - 100	10/06/97 (AYXXS-008)	15, pp.12, 20, 43, 44
R. Kendall (Livestock)	NA	09/01/98 (AZXXS-315)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 358
M. Engel 1107 S. Hwy. 4 Herington, KS	NA	09/01/98 (AZXXS-316)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 359
		10/07/97 (AYXXS-040)	15, pp.14, 22, 98, 99
C. Granzow 1008 S. 2900 Rd. Herington, KS	100	09/01/98 (AZXXS-317)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 360
		10/06/97 (AYXXS-034)	15, pp.14, 21, 87, 88
V. Kasten 102 Kasten Latimer, KS	NA	09/01/98 (AZXXS-320)	4, pg. 3-29, Fig. 5-14; and 5, App. G pg. 363
		10/06/97 (AYXXS-007)	15, pp.12, 20, 41, 42
R. Monnich 2776 L Ave. Herington, KS	120	09/01/98 (AZXXS-321)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 364
		10/06/97 (AYXXS-010)	15, pp.12, 20, 47, 48
W. Monnich 2800 L Ave. Herington, KS	93	09/01/98 (AZXXS-324)	4, pg. 3-30, Fig. 5-13; and 5, App. G pg. 367
		10/06/97 (AYXXS-012)	15, pp.14, 20, 50, 51

CONTAMINATED GROUND WATER SAMPLES
(Continued)

Sample ID	Depth (screen interval) Depth Below TOC (elevation- feet amsl)	Date (Sample Number)	Reference
F. Albrecht 111 2nd St. Latimer, KS	NA	09/01/98 (AZXXS-325)	4, pg. 3-30, Fig. 5-14; and 5, App. G pg. 368
		10/06/97 (AYXXS-004)	15, pp.12, 20, 37
T. Theel 114 3rd St. Latimer, KS	NA	09/01/98 (AZXXS-326)	4, pg. 3-30, Fig. 5-14; and 5, App. G, pg. 369
		10/06/97 (AYXXS-016)	15, pp.12, 20, 58, 59
W. Kasten North (Livestock)	NA	09/01/98 (AZXXS-327)	4, pg. 3-30, Fig. 5-13; and 5, App. G pg. 370
W. Kasten West (Livestock)	NA	09/01/98 (AZXXS-328)	4, pg. 3-29, Fig. 5-13; and 5, App. G pg. 371
C. Kasten 1169 S. 2600 Rd. Herington, KS	130	09/01/98 (AZXXS-329)	4, pg.3-30, Fig. 5-13; 5, App. G pg. 372; and 13, pg. 13
V. Jones (Livestock)	NA	09/02/98 (AZXXS-338)	4, pg. 3-30, Fig. 5-13; and 5, App. G pg. 381
		10/08/97 (AYXXS-029)	15, pp.14, 21, 80
R. Britt 812 S. 2700 Rd. White City, KS	NA	09/02/98 (AZXXS-340)	4, pg. 3-30, Fig. 5-13; and 5, App. G, pg. 383
		10/07/97 (AYXXS-045)	15, pp.14, 22, 108, 109
F. Smith 103 3rd St. Latimer, KS	NA	09/02/98 (AZXXS-341)	4, pg. 3-30, Fig. 5-14; and 5, App. G pg. 384
		10/06/97 (AYXXS-017)	15, pp.12, 21, 60, 61
D. Plumb 106 3rd St. Latimer, KS	~90	10/06/97 (AYXXS-018)	15, pp.12, 21, 62, 63
Latimer School Latimer, KS	NA	09/02/98 (AZXXS-342)	4, pg. 3-30, Fig. 5-14; and 5, App. G, pg. 385
		10/06/97 (AYXXS-009)	15, pp.12, 20, 45, 46

CONTAMINATED GROUND WATER SAMPLES
(Continued)

Sample ID	Depth (screen interval) Depth Below TOC (elevation- feet amsl)	Date (Sample Number)	Reference
M. Peck 116 Main St. Latimer, KS	NA	09/02/98 (AZXXS-343)	4, pg.3-30, Fig. 5-14; and 5, App. G pg. 386
		10/06/97 (AYXXS-015)	15, pp.12, 20, 56, 57
Hugo Kickhoefer Latimer Agriservice Latimer, KS	90	09/02/98 (AZXXS-344)	4, pg. 3-30, Fig. 5-14; and 5, App. G, pg. 387
		10/06/97 (AYXXS-001)	15, pp.12, 20, 31, 32
D. Farres 124 2nd St. Latimer, KS	NA	09/02/98 (AZXXS-345)	4, pg. 3-30, Fig. 5-14; and 5, App. G, pg. 388
		10/06/97 (AYXXS-006)	15, pp.12, 20, 39, 40
V. Gleasner 1067 S. Hwy. 4 Herington, KS	120	09/02/98 (AZXXS-346)	4, pg. 3-30, Fig. 5-13; 5, App. G pg. 389; and 13, pp. 1, 5
		10/07/97 (AYXXS-044)	15, pp.14, 22, 106, 107

Notes:

[a] No well log exists for Well WSW No. 1. Depth represents the range of reported total depths of the eight water supply wells constructed for the former Army Airfield.
amsl Above mean seal level
MW Monitoring well
NA Not available
TOC Top of casing

CONTAMINATED GROUND WATER SAMPLE CONCENTRATIONS

Sample ID	Date (sample number)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit[a] (µg/L)	Reference
MW-5	09-02-98 (AZXXS-009)	TCE	66,000	500	5, App. G pp. 5, 10, 17, 280, 416
MW-6	09-02-98 (AZXXS-034)	TCE	3,300	20	5, App. G pp. 6, 10, 33, 305, 418
MW-12	09-03-98 (AZXXS-017)	TCE cis-1,2-DCE trans-1,2-DCE Cadmium (Diss.) Lead (Dissolved)	45 11 1.2 2.4 31.2	1.0 2.0 1.0 1.0 1.0	5, App. G pp. 5, 10, 24, 25, 26, 288, 417
MW-13	09-02-98 (AZXXS-036)	TCE cis-1,2-DCE	67 18	1.0 1.0	5, App. G pp. 6, 10, 37 - 38, 307, 418
MW-17	09-03-98 (AZXXS-013)	Manganese (Dissolved)	688	1.0	5, App. G pp. 5, 10, 20, 284, 417
MW-6A	08-31-98 (AZXXS-021)	TCE PCE cis-1,2-DCE trans-1,2-DCE	5,100 5.4 110 3.7	1.0 1.0 2.0 1.0	5, App. G pp. 5, 10, 27, 28, 292, 418
MW-17B	09-03-98 (AZXXS-016)	TCE	58	1.0	5, App. G pp. 5, 10, 25, 287, 417
WSW No. 1	09/08/99 (DYXXS-315)	TCE	0.1	0.05	14, pp. 2, 4, 31, 103
D. Farres; W. Ohm 114 2nd St. Latimer, KS	08/31/98 (AZXXS-303)	TCE cis-1,2-DCE	25 1.7	0.05 0.05	5, App. G pp. 8, 10, 107, 346, 420
	10/06/97 (AYXXS-005)	TCE cis-1,2-DCE	24 2	1 K 1 K	15, pp. 29, 111, 113, 114, 115

CONTAMINATED GROUND WATER SAMPLE CONCENTRATIONS
(Continued)

Sample ID	Date (sample number)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit[a] (µg/L)	Reference
R. (Bob) Diekman 212 North Street Latimer, KS	08/31/98 (AZXXS-304)	TCE cis-1,2-DCE	28 1.9	0.05 0.05	5, App. G pp. 8, 10, 110, 111, 347, 420
	10/06/97 (AYXXS-002)	TCE cis-1,2-DCE	33 2	2 K 2 K	15, pp. 29, 111, 113, 114, 115
Zion Lutheran Church Latimer, KS	08/31/98 (AZXXS-305)	TCE cis-1,2-DCE	26 1.8	0.05 0.05	5, App. G pp. 8, 10, 110, 111, 348, 420
	10/06/97 (AYXXS-003)	TCE cis-1,2-DCE	32 2	2 K 2 K	15, pp. 29, 111, 113, 114, 115
Bernice Diekman 111 Main Street Latimer, KS	08/31/98 (AZXXS-306)	TCE cis-1,2-DCE	21 1.4	0.05 0.05	5, App. G pp. 8, 10, 110, 111, 349, 420
	10/06/97 (AYXXS-014)	TCE cis-1,2-DCE	20 1	1 K 1 K	15, pp. 29, 111, 113, 118, 119
Dawn Wendt 2615 W. Hwy. 4 White City, KS	08/31/99 (AZXXS-312)	TCE cis-1,2-DCE	16 0.68	0.05 0.05	5, App. G pp. 8, 10, 113, 114, 355, 420
	10/07/97 (AYXXS-025)	TCE	10	1 K	15, pp. 30, 112, 113, 122
W. Kasten 2649 W. Hwy. 4 White City, KS	08/31/98 (AZXXS-313)	TCE	4.8	0.05	5, App. G pp. 8, 10, 114, 356, 420
	10/06/97 (AYXXS-031)	TCE	4	1 K	15, pp. 30, 112, 113, 124
R. Harlow 106 Kasten Latimer, KS	10/06/97 (AYXXS-008)	TCE cis-1,2-DCE	17 2	1 K 1 K	15, pp. 29, 111, 113, 116, 117
R. Kendall (Livestock)	09/01/98 (AZXXS-315)	TCE	3.1	0.05	5, App. G pp. 8, 10, 117, 358, 420

CONTAMINATED GROUND WATER SAMPLE CONCENTRATIONS
(Continued)

Sample ID	Date (sample number)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit[a] (µg/L)	Reference
M. Engel 1107 S. Hwy. 4 Herington, KS	09/01/98 (AZXXS-316)	TCE	19	0.05	5, App. G pp. 8, 10, 117, 359, 420
	10/07/97 (AYXXS-040)	TCE	19	1 K	15, pp. 30, 112, 113, 128
C. Granzow 1008 S. 2900 Rd. Herington, KS	09/01/98 (AZXXS-317)	TCE	21	0.05	5, App. G pp. 8, 10, 117, 360, 420
	10/06/97 (AYXXS-034)	TCE	17	1 K	15, pp. 30, 112, 113, 126
V. Kasten 102 Kasten Latimer, KS	09/01/98 (AZXXS-320)	TCE cis-1,2-DCE	31 2.2	0.05 0.05	5, App. G pp. 8, 10, 119, 120, 363, 420
	10/06/97 (AYXXS-007)	TCE cis-1,2-DCE	27 2	1 K 1 K	15, pp. 29, 111, 113, 116, 117
R. Monnich 2776 L Ave. Herington, KS	09/01/98 (AZXXS-321)	TCE cis-1,2-DCE	24 1.4	0.05 0.05	5, App. G pp. 8, 10, 119, 120, 364, 420
	10/06/97 (AYXXS-010)	TCE cis-1,2-DCE	17 1	1 K 1 K	15, pp. 29, 111, 113, 116, 117
W. Monnich 2800 L Ave. Herington, KS	09/01/98 (AZXXS-324)	TCE cis-1,2-DCE	26 1.3	0.05 0.05	5, App. G pp. 9, 10, 122, 123, 367, 420
	10/06/97 (AYXXS-012)	TCE cis-1,2-DCE	16 1	1 K 1 K	15, pp. 29, 111, 113, 118, 119

CONTAMINATED GROUND WATER SAMPLE CONCENTRATIONS
(Continued)

Sample ID	Date (sample number)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit[a] (µg/L)	Reference
F. Albrecht 111 2nd St. Latimer, KS	09/01/98 (AZXXS-325)	TCE cis-1,2-DCE	33 2.3	0.05 0.05	5, App. G pp. 9, 10, 122, 123, 368, 420
	10/06/97 (AYXXS-004)	TCE cis-1,2-DCE	28 2	2 K 2 K	15, pp. 29, 111, 113, 114, 115
T. Theel 114 3rd St. Latimer, KS	09/01/98 (AZXXS-326)	TCE cis-1,2-DCE	29 2.0	0.05 0.05	5, App. G pp. 9, 10, 122, 123, 369, 421
	10/06/97 (AYXXS-016)	TCE cis-1,2-DCE	34 3	1 K 1 K	15, pp. 29, 111, 113, 120, 121
W. Kasten North (Livestock)	09/01/98 (AZXXS-327)	TCE cis-1,2-DCE	43 3.4	0.05 0.05	5, App. G pp. 9, 10, 122, 123, 370, 421
W. Kasten West (Livestock)	09/01/98 (AZXXS-328)	TCE cis-1,2-DCE	18 1.5	0.05 0.05	5, App. G pp. 9, 10, 122, 123, 371, 421
C. Kasten 1169 S. 2600 Rd. Herington, KS	09/01/98 (AZXXS-329)	TCE	56	0.05	5, App. G pp. 9, 10, 126, 372, 421
V. Jones (Livestock)	09/02/98 (AZXXS-338)	TCE cis-1,2-DCE	280 9.6	2.5 2.5	5, App. G pp. 9, 10, 128, 381, 421
	10/08/97 (AYXXS-029)	TCE cis-1,2-DCE	190 8	1 K 1 K	15, pp. 30, 112, 113, 124, 125
R. Britt 812 S. 2700 Rd. White City, KS	09/02/98 (AZXXS-340)	TCE	5.3	0.05	5, App. G pp. 9, 10, 131, 383, 421
	10/07/97 (AYXXS-045)	TCE	3	1 K	15, pp. 30, 112, 113, 130
F. Smith 103 3rd St. Latimer, KS	09/02/98 (AZXXS-341)	TCE cis-1,2-DCE	38 3.1	0.05 0.05	5, App. G pp. 9, 10, 131, 384, 421

CONTAMINATED GROUND WATER SAMPLE CONCENTRATIONS
(Continued)

Sample ID	Date (sample number)	Hazardous Substance	Concentration (µg/L)	Sample Detection Limit[a] (µg/L)	Reference
	10/06/97 (AYXXS-017)	TCE cis-1,2-DCE	31 2	1 K 1 K	15, pp. 29, 111, 113, 120, 121
D. Plumb 106 3rd St. Latimer, KS	10/06/97 (AYXXS-018)	TCE cis-1,2-DCE	20 1	1 K 1 K	15, pp. 29, 111, 113, 120, 121
Latimer School, Latimer, KS	09/02/98 (AZXXS-342)	TCE cis-1,2-DCE	13 1.2	0.05 0.05	5, App. G pp. 9, 10, 131, 385, 421
	10/06/97 (AYXXS-009)	TCE cis-1,2-DCE	19 1	1 K 1 K	15, pp. 29, 111, 113, 116, 117
M. Peck 116 Main St. Latimer, KS	09/02/98 (AZXXS-343)	TCE cis-1,2-DCE	21 1.5	0.05 0.05	5, App. G pp. 9, 10, 131, 386, 421
	10/06/97 (AYXXS-015)	TCE cis-1,2-DCE	19 1	1 K 1 K	15, pp. 29, 111, 113, 118, 119
Latimer Agriservice Latimer, KS	09/02/98 (AZXXS-344)	TCE cis-1,2-DCE	21 1.0	0.05 0.05	5, App. G pp. 9, 10, 134, 387, 421
	10/06/97 (AYXXS-001)	TCE cis-1,2-DCE	23 1	1 K 1 K	15, pp. 29, 111, 113, 114, 115
D. Farres 124 2nd St. Latimer, KS	09/02/98 (AZXXS-345)	TCE	1.8	0.05	5, App. G pp. 9, 10, 134, 388, 421
	10/06/97 (AYXXS-006)	TCE cis-1,2-DCE	23 2	1 K 1 K	15, pp. 29, 111, 113, 116, 117
V. Gleasner 1067 S. Hwy. 4 Herington, KS	09/02/98 (AZXXS-346)	TCE	14	0.05	5, App. G pp. 9, 10, 134, 389, 421
	10/07/97 (AYXXS-044)	TCE	10	1 K	15, pp. 30, 112, 113, 130

CONTAMINATED GROUND WATER SAMPLE CONCENTRATIONS
(Continued)

Notes:

a Sample Detection Limits were determined for the activity from non detect samples (where the sample detection limits by compound was reported), then applying this compound specific detection limit to "hit samples." Where sample dilutions may have increased detection limits, the dilution factor was multiplied by an undiluted detection limit for that compound.

K Actual value of sample is less than the reported value. In this case, the sample quantitation limit is less than the value provided.

DCE Dichloroethylene

MW Monitoring well

PCE Perchloroethylene (also known as tetrachloroethylene)

TCE Trichloroethylene

µg/L Micrograms per liter

Level I Samples

Sample Identification: D. Farres, W. Ohm well at 114 2nd Street (AZXXS-303)

TCE and cis-1,2-DCE were detected in a private water supply well owned by Dyas Farres and rented by W. Ohm (Ref. 4, pg. 5-20). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to the health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	25 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: R. Deikman well at 212 North Street. (AZXXS-304)

TCE and cis-1,2-DCE were detected in a private water supply well owned by R. Deikman in Latimer, Kansas (Ref. 4, pg. 5-20). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	28 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: Zion Lutheran Church (AZXXS-305)

TCE and cis-1,2-DCE were detected in a private water supply well owned by the Lutheran church in Latimer, Kansas (Ref. 4, pg. 5-20). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	26 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: B. Deikman well at 111 Main Street (AZXXS-306)

TCE and cis-1,2-DCE were detected in a private water supply well owned by B. Deikman in Latimer, Kansas (Ref. 4, pg. 5-20). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	21 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: D. Wendt on Highway 4 east of Latimer (AZXXS-312)

TCE and cis-1,2-DCE were detected in a private water supply well owned by D. Wendt east of Latimer, Kansas (Ref. 4, pg. 5-20). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 12,000 feet north of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	16 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: R. Harlow well at 106 Kasten (AYXXS-008)

TCE and cis-1,2-DCE were detected in a private water supply well owned by R. Harlow in Latimer, Kansas (Ref. 15, pp. 20, 24). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	17 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: M. Engel well at 1107 S. Highway 4 (AZXXS-316)

TCE was detected in a private water supply well owned by M. Engel in Latimer, Kansas (Ref. 4, pg. 5-20). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 14,200 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	19 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: C. Granzow well at 1008 S. 2900 Road Church (AZXXS-317)

TCE was detected in a private water supply well owned by C. Granzow located west of Latimer, Kansas (Ref. 4, pg. 5-20, Figure 5-13). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 20,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The concentration of TCE in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	21 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: V. Kasten well at 102 Kasten (AZXXS-320)

TCE and cis-1,2-DCE were detected in a private water supply well owned by V. Kasten of Latimer, Kansas (Ref. 4, pg. 5-20, Figure 5-14). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	31 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: R. Monnich well at 2776 L Avenue (AZXXS-321)

TCE and cis-1,2-DCE were detected in a private water supply well owned by R. Monnich located just west of Latimer, Kansas (Ref. 4, pg. 5-20, Figure 5-13). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-29). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	24 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: W. Monnich well at 2800 L Avenue (AZXXS-324)

TCE and cis-1,2-DCE were detected in a private water supply well owned by W. Monnich located just west of Latimer, Kansas (Ref. 4, pg. 5-20, Figure 5-13). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 16,900 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	26 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: F. Albrecht well at 111 Second Street (AZXXS-325)

TCE and cis-1,2-DCE were detected in a private water supply well owned by F. Albrecht in Latimer, Kansas (Ref. 4, pg. 5-20, Figure 5-14). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). This residence was sampled in October 1997 and, at that time, was occupied by at least one person (Ref. 15, pg. 20). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	33 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: T. Theel well at 114 3rd Street (AZXXS-326)

TCE and cis-1,2-DCE were detected in a private water supply well owned by T. Theel of Latimer, Kansas (Ref. 4, pg. 5-20, Figure 5-14). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	29 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: C. Kasten well at 1169 S. 2600 Road (AZXXS-329)

TCE was detected in a private water supply well owned by C. Kasten (Ref. 4, pg. 5-20, Figure 5-13). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 2,500 feet north of the TCPA Site (Ref. 4, pg. 3-30). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	56 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: R. Britt well at 812 S. 2700 Road (AZXXS-340)

TCE was detected in a private water supply well owned by R. Britt located north of Latimer, Kansas (Ref. 4, pg. 5-21, Figure 5-13). TCE was detected at a concentration above the MCL for the contaminant. This water supply well is located 23,500 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The concentration of TCE in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	5.3 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: F. Smith well at 103 Third Street (AZXXS-341)

TCE and cis-1,2-DCE were detected in a private water supply well owned by F. Smith of Latimer, Kansas (Ref. 4, pg 5-21, Figure 5-14). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	38 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: D. Plumb well at 106 Third Street (AYXXS-018)

TCE and cis-1,2-DCE were detected in a private water supply well owned by D. Plumb of Latimer, Kansas (Ref. 15, pp. 12, 113, 120, 121). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 15, Table 1). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	20 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: M. Peck well at 116 Main Street (AZXXS-343)

TCE and cis-1,2-DCE were detected in a private water supply well owned by M. Peck of Latimer, Kansas (Ref. 4, pg. 5-21, Figure 5-14). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	21 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: V. Gleasner well at 1067 S. Highway 4 (AZXXS-346)

TCE was detected in a private water supply well owned by V. Gleasner located southwest of Latimer, Kansas (Ref. 4, pg. 5-21, Figure 5-13). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 13,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The concentration of TCE in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	14 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Sample Identification: Latimer Agriservice well (AZXXS-344)

TCE and cis-1,2-DCE were detected in a private water supply well serving the Latimer Agriservice in Latimer, Kansas (Ref. 4, pg. 5-21, Figure 5-14). TCE was detected at a concentration above the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located 15,800 feet northwest of the TCPA Site (Ref. 4, pg. 3-30). The TCE concentration in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	21 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Level II Samples

Sample Identification: Water Supply Well No. 1. (DYXXS-315)

In September 1999, TCE was detected in the supply well (WSW No. 1) at the TCPA Site (Ref. 14, pp. 31, 103). TCE was detected at a concentration above background but below the MCL and the cancer risk screening concentration for the contaminant. This water supply well is located at the TCPA Site, south of Hangar 1 (Ref. 17, Figure 3). The concentration of TCE in the above sample is compared to health-based benchmarks below.

Reference for Benchmarks: 2, pg. B-40

Hazardous Substance	Hazardous Substance Concentration	Benchmark	Benchmark Level
Trichloroethylene	0.1 µg/L	Maximum Contaminant Level	5 µg/L
		Cancer Risk Screening Concentration	7.7 µg/L

Attribution: TCE is a man-made chemical that does not occur naturally in the environment (Ref. 18, pg. 1). TCE is documented to have been used at the TCPA Site as a degreaser (Ref. 6a, pg.3; and Ref. 4, pg. 4-1). TCE is known to degrade in the environment to DCE, then vinyl chloride (Ref. 18, pg. 91). The highest levels of contamination are reported in groundwater samples collected from monitoring wells located at the facility, in particular from monitoring wells located adjacent to Hangar 4 (Ref. 4, pp. 5-8, 5-9). During an October, 1997 removal site evaluation, private wells in the community of Latimer, Kansas and the surrounding area adjacent to the TCPA facility were sampled (Ref.15, pg. 1). No sources other than the TCPA facility were identified to which TCE contamination could be attributed (Ref. 15, pp. 6, 7). Only agricultural land is located upgradient of the TCPA Site (Ref. 10, pg. 1-2; and Ref. 3). Contamination has been observed in private wells located to the north and west of the site, which is the same direction as groundwater flow for all aquifers (Ref. 4, Fig. 5-6, 5-7, 5-8). Finally, wells to the south and east of site do not contain the contaminants found in downgradient wells (Ref. 4, Fig. 5-13).

The metals cadmium, lead, and manganese were also reported at elevated concentrations in soils at Hangar 1 (Source 2) (Ref. 4, pp. 4-8, 4-9, Table 4-3, Fig. 4-2). These same metals were found at elevated concentrations in samples collected from groundwater Monitoring Wells MW-12 and MW-17, both located downgradient of Hangar 1 (Ref. 4, pg. 5-18, Fig. 5-6).

Hazardous Substances Released

As documented above, an observed release to groundwater has been established. The following hazardous constituents have been documented by chemical analysis to meet the criteria of an observed release, as defined by 40 CFR 300, App. A, Sections 2.3 and 3.1.1 (Ref. 1): trichloroethylene, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, tetrachloroethylene, cadmium, lead, and manganese.

In accordance with 40 CFR 300, App. A, Section 3.1.1 (Ref. 1), an observed release factor value of 550 is assigned below for the Chase Group Aquifers, and potential to release is not evaluated.

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Ground Water Observed Release Factor Value: 550

3.2 WASTE CHARACTERISTICS

3.2.1 Toxicity/Mobility

The Toxicity/Mobility characteristics of hazardous substances available to release from sources 1, 2, and 3 are summarized below.

TOXICITY / MOBILITY FACTOR VALUES

Hazardous Substance	Source Number	Toxicity Factor Value	Mobility Factor Value[1]	Toxicity/Mobility Factor Value (Table 3-9)[2]	Reference
Trichloroethylene	Hangar 4 Hangar 1 PBA	10	1[a]	10	2, pg. B-19
Tetrachloroethylene	Hangar 1	100	1[a]	100	2, pg. B-18
cis-1,2-Dichloroethylene	Hangar 4 Hangar 1 PBA	100	1[a]	100	2, pg. B-8
trans-1,2-Dichloroethylene	Hangar 1	100	1[a]	100	2, pg. B-8
Vinyl Chloride	Hangar 1	10,000	1	10,000	2, pg. B-20
1,1-Dichloroethylene	Hangar 1	100	1	100	2, pg. B-7
1,1,2-Trichloroethane	Hangar 1	1,000	1	1,000	2, pg. B-19
Lead	Hangar 1 PBA	10,000	1[a]	10,000	2, pg. B-13
Cadmium	Hangar 1 PBA	10,000	1[a]	10,000	2, pg. B-4
Chromium	Hangar 1 PBA	10,000	0.01	100	2, pg. B-5
Manganese	Hangar 1	10,000	1[a]	10,000	2, pg. B-13

Notes:

1 Unless specified otherwise, groundwater mobility factor values were based on non-karst environments.

2 40 CFR 300, App. A, Table 3-9 (Reference 1)

[a] According to 40 CFR 300, App. A, Section 3.2.1.2 (Ref. 1), a mobility factor value of 1 is assigned, because the hazardous substance met the criteria of an observed release by chemical analysis, as documented in Section 3.1.1, pages 34 through 47 of this documentation record.

PBA Potential Burial Area

The hazardous substances with the highest toxicity/mobility factor value are vinyl chloride, cadmium, lead, and manganese. Therefore, an assigned value of 1×10^4 is entered below.

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Toxicity/Mobility Factor Value: 1×10^4

3.2.2 Hazardous Waste Quantity

Source Number	Source Hazardous Waste Quantity Value (40 CFR 300, App. A, Section 2.4.2.1.5)	Is Source Hazardous Constituent Quantity Data Complete? (yes/no)
1.	0.023	no
2.	0.276	no
3.	0.103	no
Sum of Values:	0.402	

The hazardous constituent quantity has not been defined or adequately characterized for any of the sources investigated at the TCPA Site. A release of chlorinated solvents, primarily TCE, from the facility to privately owned, domestic wells has been documented (see Section 3.1.1, pages 34 through 47 of this documentation record). Further, the concentration of TCE in private wells exceeds associated health-based benchmark criteria, as defined in 40 CFR 300, App. A, Sections 2.5, 2.5.1, and 2.5.2 (Ref. 1), constituting a Level I release.

Because groundwater targets are subject to Level I concentrations and hazardous constituent quantity has not been adequately determined, a hazardous waste quantity factor value of 100 is assigned, in accordance with 40 CFR 300, App. A, Section 2.4.2.2 (Ref. 1).

3.2.3 Waste Characteristics Factor Category Value

A waste characteristics product is computed by multiplying the toxicity/mobility factor value by the hazardous waste quantity factor value (the product of which is subject to a maximum value of 1×10^8). This product is then entered into 40 CFR 300, App. A, Table 2-7 (Ref. 1) to obtain a waste characteristics factor value.

Toxicity/Mobility Factor Value
× Hazardous Waste Quantity Factor Value: 1×10^6
$10{,}000 \times 100 = 1 \times 10^6$

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Hazardous Waste Quantity Factor Value: 100
Waste Characteristics Factor Category Value: 32

3.3 TARGETS

The distance from a source for Water Supply Well 1 is measured from Hangar 4 (source 1). The distance from a source to all other wells are measured from Hangar 1 (source 2).

TARGET POPULATION

Well Identification	Distance from Source[a] (miles)	Contaminated Aquifer	Level I Contamination (yes/no)	Level II Contamination (yes/no)	Potential Contamination (yes/no)	Reference
WSW No. 1	0.15	Chase Group	No	Yes	No	4, Fig. 3-5; and 14, pp. 31, 103
D. Farres; W. Ohm 114 2nd St. Latimer, KS	3.05	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
R. Diekman 212 North St. Latimer, KS	3.05	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
Zion Lutheran Church Latimer, KS	3.1	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
B. Diekman 111 Main St. Latimer, KS	3.1	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
D. Wendt 2615 W. Hwy. 4 White City, KS	2.6	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13
R. Harlow 106 Kasten Latimer, KS	3.2	Chase Group	Yes	No	No	15, pp. 12, 20, 43, 116
R. Kendall (Livestock)	1.6	Chase Group	No	Yes	No	4, pg. 5-20, Fig. 5-13
M. Engel 1107 S. Hwy. 4 Herington, KS	2.9	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13

TARGET POPULATION (Continued)

Well Identification	Distance from Source[a] (miles)	Contaminated Aquifer	Level I Contamination (yes/no)	Level II Contamination (yes/no)	Potential Contamination (yes/no)	Reference
C. Granzow 1008 S. 2900 Rd. Herington, KS	3.9	Chase Group	Yes	No	No	4, pg. 5-20, Fig 5-13
V. Kasten 102 Kasten Latimer, KS	3.2	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
R. Monnich 2776 L Ave. Herington, KS	3.25	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13
W. Monnich 2800 L Ave. Herington, KS	3.5	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13
F. Albrecht 111 2nd St. Latimer, KS	3.05	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
T. Theel 114 3rd St. Latimer, KS	3.05	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-14
W. Kasten North (Livestock)	2.3	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13
W. Kasten West (Livestock)	2.3	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13
C. Kasten 1169 S. 2600 Rd. Herington, KS	0.85	Chase Group	Yes	No	No	4, pg. 5-20, Fig. 5-13
V. Jones (Livestock)	0.45	Chase Group	Yes	No	No	4, pg. 5-21, Fig. 5-13
R. Britt 812 S. 2700 Rd. White City, KS	4.5	Chase Group	Yes	No	No	4, pg. 5-21, Fig. 5-13
F. Smith 103 3rd St. Latimer, KS	3.1	Chase Group	Yes	No	No	4, pg. 5-21, Fig. 5-14

Well Identification	Distance from Source[a] (miles)	Contaminated Aquifer	Level I Contamination (yes/no)	Level II Contamination (yes/no)	Potential Contamination (yes/no)	Reference
D. Plumb 106 3rd St. Latimer, KS	3.2	Chase Group	Yes	No	No	15, pp. 12, 113, 120, 121;
M. Peck 116 Main St. Latimer, KS	3.1	Chase Group	Yes	No	No	4, pg. 5-21, Fig. 5-14
Latimer Agriservice Latimer, KS	2.95	Chase Group	Yes	No	No	4, pg. 5-21, Fig. 5-14
V. Gleasner 1067 S. Hwy. 4 Herington, KS	2.9	Chase Group	Yes	No	No	4, pg. 5-21, Fig. 5-13

Note:

[a] Distances are approximate. Exact distances were not determined because all wells in the table are subject to Level I or Level II contamination.

3.3.1 Nearest Well

The nearest water supply well is designated as WSW No. 1 and is located at the TCPA Site, approximately 800 feet (0.15 mile) south of Hangar 4 (Ref. 4, Figure 3-1). This well is the primary water supply well for about 67 workers at the TCPA Site (Ref. 4, pg. 5-8). The well contains TCE at concentrations below health-based benchmarks.

Well: WSW No. 1
Level of Contamination (I, II, or potential): Level II
If potential contamination, distance from source in miles: Not applicable

The nearest privately-owned water supply well is located approximately 4,400 feet (0.85 mile) north of Hangar 1 at the TCPA Site and is owned by C. Kasten (Ref. 4, pg. 5-7, Table 3-5, Figure 5-13). This well is used for domestic drinking water (Ref. 4, pg. 3-30). The well contains TCE at concentrations above health-based benchmarks (Ref. 4, pg. 5-20).

Well: C. Kasten, Sample No. AZXXS329
Level of Contamination (I, II, or potential): Level I
If potential contamination, distance from source in miles: Not applicable

Because Level I contamination has been documented in a drinking water well, a nearest well factor value of 50 is assigned below, in accordance with 40 CFR 300, App. A, Section 3.3.1 (Ref. 1).

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Nearest Well Factor Value: 50

3.3.2 Population

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

Wells that are contaminated but were not included in the evaluation, include the water supply well at the Zion Lutheran Church and the Public School in Latimer, Kansas. This church well has been sampled in October 1997 and August 1998 and was shown both times to contain TCE at Level I concentrations (See Section 3.1.1, page 43 of this documentation record). Thirty-five people regularly attend Sunday services, and eight children attend Sunday school for approximately 1.5 hours each week (Ref.19, pg. 1). This population was not included as a target, because it was believed that the congregation did not meet the definition of student population (Ref. 1). The Latimer school well was also sampled in October 1997 and September 1998 and was shown both times to contain TCE at Level I concentrations (See Section 3.1.1, page 46 of this documentation record). A Level I population was not assigned to the school because there is no documentation in any report related to the site that students attend the school.

LEVEL I POPULATION

Level I Well	Population	Reference
D. Farres/W. Ohm 114 2nd St., Latimer, KS	2.41[a]	15, pp. 20, 38; Ref. 20
R. Diekman 212 North St., Latimer, KS	3	15, pp. 20, 34
B. Diekman 111 Main St., Latimer, KS	1	15, pp. 20, 55
D. Wendt 2615 W. Hwy. 4, White City, KS	2	15, pp. 21, 73
R. Harlow 106 Kasten, Latimer, KS	4	15, pp. 20, 44
M. Engel 1107 S. Hwy. 4, Herington, KS	2	15, pp. 22, 99
C. Granzow 1008 S. 2900 Rd., Herington, KS	3	15, pp. 21, 88
V. Kasten 102 Kasten, Latimer, KS	2.41[a]	15, pp. 20, 42

LEVEL I POPULATION
(Continued)

Level I Well	Population	Reference
R. Monnich 2776 L Ave., Herington, KS	3	15, pp. 20, 48
W. Monnich 2800 L Ave., Herington, KS	2	15, pp. 20, 51
F. Albrecht 111 2nd St., Latimer, KS	2.41[a]	15, pp. 20, 37; Ref. 20
T. Theel 114 3rd St., Latimer, KS	1	15, pp. 20, 59
C. Kasten 1169 S. 2600 Rd., Herington, KS	2	21, pg. 1
R. Britt 812 S. 2700 Rd., White City, KS	2	15, pp. 22, 109
F. Smith 103 3rd St., Latimer, KS	4	15, pp. 20, 61
D. Plumb 106 3rd St., Latimer, KS	1	15, pp. 21, 63
M. Peck 116 Main St., Latimer, KS	1	15, pp. 20, 57
Latimer Agriservice Latimer, KS	1[b]	15, pp. 20, 32
V. Gleasner 1067 S. Hwy. 4, Herington, KS	4	15, pp. 22, 107

Notes:

[a] Where population was not provided, the Morris County average of 2.41 persons per occupied housing unit was used (Ref. 20).

[b] One person was assumed employed full time at the Latimer Agriservice.

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Population Served by
Level I Wells: 43.23 Level I Concentrations Factor Value: 432.3

3.3.2.3 Level II Concentrations

LEVEL II POPULATION

Level II Well	Population	Reference
Water Supply Well No. 1 at TCPA	67	4, pg. 5-8

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Level II Concentrations Factor Value: 67

3.3.2.4 Potential Contamination

A sparse rural population of about 98 residences exists within a four-mile radius of the site (Ref. 4, pg. 5-8). No rural water district sources or other municipal water supplies are located within the 4-mile radius, other than the facility well, WSW No. 1, which serves the 67 workers at the TCPA site (Ref. 4, pg. 5-8). Of the privately owned wells, 21 have been shown to be subject to Level I or II contamination, as documented above.

Because the sparse rural population and absence of municipal water supplies within a 4-mile radius of the site, the potential contamination factor value adds minimally to overall target scores. Level I and II targets documented above are sufficient to maximize the ground water migration pathway score. The potential to release factor value is therefore not evaluated.

Distance Category	Population	Reference	Distance-Weighted Population Value

Sum of Distance-Weighted Population Values: Not Scored

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Potential Contamination Factor Value: Not Scored

3.3.3 Resources

Ground water is the primary source of water for human consumption and agricultural activities in the area surrounding the TCPA Site (Ref. 4, pg. 5-7).

Well	Aquifer	Resource Use	Reference
Vernon Jones (Livestock)	Chase Group	Watering of commercial livestock	22, pg. 1
Edward Koehler	Chase Group	Irrigation	13, pp. 18, 20
Tri County Feedlot	Chase Group	Watering of commercial livestock	13, pg. 21
Black Diamond Feedlot	Chase Group	Watering of commercial livestock	13, pp. 7, 14
Carl Atkinson	Chase Group	Watering of commercial livestock	13, pg. 11

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Resources Factor Value: 5

3.3.4 Wellhead Protection Area

No area within 4 miles of the TCPA Site is located in a state or federally designated wellhead protection area (Ref. 23).

Area	Use	Reference	Value

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Wellhead Protection Area Factor Value: 0